

Flight, June 3, 1911.



FLIGHT



First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

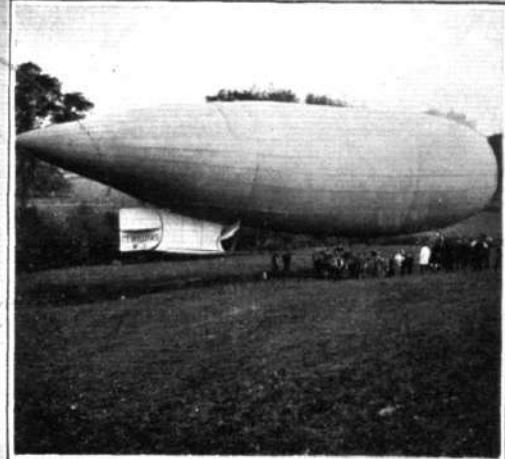
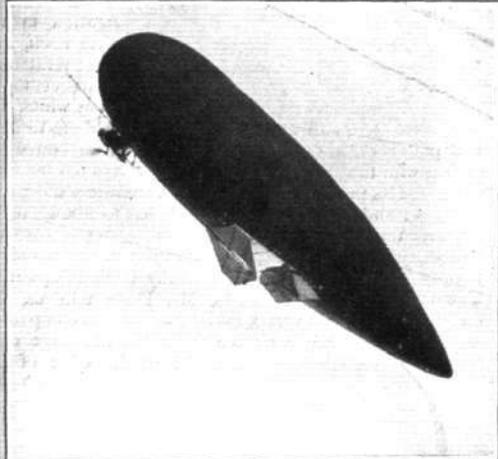
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Photos by Mr. Andrew L. Dennison.

THE WILLOWS AIRSHIP AT LEAMINGTON.—Some snaps of this little dirigible after its flight from the Knowles Oxygen Company's Wolverhampton Works to Leamington and Whitnash. In the two upper views the airship is seen descending at Kenilworth Road, Leamington, and in the lower it helps in its "setting" to a charming picture.

COPYING NATURE IN FLIGHT.

NOTHING succeeds like success, we are told, and yet success along any given line may actually produce a species of reflex action which is quite the reverse of good in its ultimate results. It would be utterly impossible for even the most crassly prejudiced to argue that the main problem of dynamic flight has not been solved, but even that success may quite conceivably have had such a reflex effect as we have in mind by obscuring certain issues and relegating to the background particular lines of thought which the very nature of the success achieved has rendered partially heterodox. Possibly the word heterodox is a somewhat strong term to apply in the present instance, because, far as the technical world has undoubtedly progressed, it is very doubtful if there is any particular practice which can be properly described as orthodox. But there is always the point to be kept in mind that what is generally accepted as correct in theory to-day becomes the orthodox in practice to-morrow. Thus there is always the danger that something far removed from the absolutely correct in principle may from the very nature of its success be accepted temporarily as the last word. Let us hasten to say that we do not suggest that the science of aerodynamics has arrived at anything like that stage so far as it has progressed. There are not wanting, however, certain signs which go to show that on the commercial side there is a disposition manifested to proceed along conventional lines, ignoring to a great extent the investigations of workers along the less generally accepted lines. This we regard as a mistaken policy and as one which is not by any means calculated to help forward the cause of progress. Suppose we take the case of the helicopter as an example. Would any of the firms who are engaged in the development of the commercial side of flight take the trouble thoroughly to investigate the claims of any inventor—however accomplished in exact science he might be—who submitted such a machine for consideration? Some of them might, but on the other hand the balance of probability is that none of them would, chiefly because no form of helicopter has been a success so far, while the more orthodox type of aeroplane has succeeded beyond the most sanguine expectations. And yet it is impossible to say as yet that the one principle is any more ultimately right than the other is wrong. It may quite well be that discoveries to come may prove that the experimenters who pin their belief to the helicopter may be much nearer right in their faith than the school of the aeroplane. We must not be understood to say that our view of things is that the final word will be found in the helicopter or any other specialised type of machine—the argument simply is that success in one direction does not mean that even greater success is impossible in another. From that point of view we cannot but deplore—though in by far the bulk of cases the line taken is obviously right—what we may call the want of commercial consideration given to those who are following other than orthodox lines of thought.

The aeroplane as we know it is essentially a high-speed mechanical contrivance. It flies, but it flies in a manner which Nature has never found complete for any of her creatures of the air, and it flies, therefore, to a great extent in spite of itself. We may, we think, take it that not even the most trammelled of believers in the orthodox will deny that if Nature's own methods could be more closely approximated, a much greater degree of efficiency would be arrived at. That being so, it seems a

pity—indeed a misfortune—that greater attention is not being systematically paid to the study of natural flight and that the few really qualified workers who are giving the subject their serious and skilled attention should run a risk of meeting with scant appreciation of their efforts. So much is this the case that it has seemed almost as if these workers had become discouraged and dropped their investigations, for it is long since any new theories based on the dynamics of natural flight have been heard of. That the subject, however, is still receiving intelligent attention we have ample evidence in data laid before us by at least two investigators, one in this country and another in India. From each of these workers we have received articles of surpassing interest, the one which we publish this week from the pen of Mr. T. A. Dring, describing what he calls his vortex principle of flight, being worthy of the very closest attention. It must be understood that our own information in the matter is based almost entirely on the article itself, and that we make no pretence to confirmation or refutation.

Mr. Dring's especial study has been insect flight, particularly the flight of those wonderful flies which one sees poised in a still atmosphere and which seem to have the power of instantaneously darting in any direction almost with the rapidity of light itself. Quite obviously these insects practise a mode of flight entirely dissimilar to birds; and it seems to have been left to Mr. Dring to discover that their wings rotate so that each describes an imaginary cone in space, with its apex at the shoulder joint of the wing and its axis normally inclined upwards. The effect of this rotation is, Mr. Dring tells us, the creation of an aerial vortex inside the cone, accompanied as a matter of course by the tangential discharge of a spreading air-stream at right-angles to the edge of the wing. The air that feeds this vortex enters through the base of the cone, its acceleration and downward discharge produce the upward resultant which supports the weight of the insect; and according to the position of the wings, which can be altered at will, so the axes of the cones incline one way or the other, altering the magnitude and direction of the vector forces and bringing about the sudden changes in the insect's position which are such a startling feature of its flight.

Having discovered this principle of insect flight, the next thing to be done was manifestly to apply it to the man-made flying machine; and Mr. Dring proceeds to show how this can be done. Experiments have been conducted with what he calls "vortex propellers" in which the blades form a V to each other, the axes of the shafts being inclined upwards from the body of the machine. So far as the mechanical side of the problem is concerned it is quite impossible to pass judgment in the absence of numerical data. The problem of the helicopter, to which this is in a measure allied, is sufficiently illusive to make substantiated facts essential to its proper understanding. Everyone is familiar with the successful manner in which the toy helicopter can be made to fly—and all are equally familiar with the notable absence of any practical flying machine built on these lines. It is for Mr. Dring to show the world that there is yet a gateway leading to success. For our own part, we can only hope that amply sufficient encouragement will be forthcoming from those in a suitable industrial position to enable him to demonstrate beyond all question the absolute success or failure of his theories in their practical application.

PARIS-MADRID.

THE last stage of the Paris-Madrid Race, from San Sebastian to Madrid, proved to be by far the most trying of the whole journey. The distance of this was roughly 270 miles, the course marked out being through very mountainous country, over snow-capped peaks, rising in some instances to fully 5,000 ft. Little wonder, therefore, that the race was not completed on the Thursday of last week, as originally intended, the time being extended in view of the severe weather and the obstacles of nature to be overcome, thereby giving the courageous aviators still remaining in the race a chance to complete their very arduous undertaking. Vedrines, as throughout the race, was far ahead of all competitors, and ultimately arrived at Madrid in 27 hrs. 6 mins. from the official time of his original send-off from San Sebastian. The entire journey from Paris to the Spanish capital occupied officially 37h. 26m. 12s.

On Thursday Vedrines reached Burgos, some 234 kiloms. from Madrid, having been officially started from the Oudaressa aerodrome at San Sebastian at 5 a.m. on Thursday. Following him, Garros at 5.5 and Gibert at 5.10, were also notified of their start officially, but none of them were actually in readiness to get away for their journey. The mist was inclined to be rather thicker than they cared in any case to steer through, in view of the mountain climbing which would have to be done. Gibert, at 5.30 was the first actually to cross the line, rising very gracefully for a short period, but returning to the starting ground owing to the difficulties of locating himself by reason of the fog. A few minutes later Vedrines contemplated taking his turn, but it was again Gibert who once more determined to make a start. Taking a short rise, he made for the direction of the sea, his time for leaving the ground being 6.24; he crossed over the actual starting line at oh. 28m. 35s. a.m. Flying over the sea at about 800 metres, he passed over the castle on Mount Iguelo and then over the town and the Royal Palace, disappearing in the distance towards the mountains. Garros Blériot, some twenty minutes later, was brought to the line, and at 7.12 he rose from the aerodrome, and after an impressive figure of eight followed in the wake of Gibert. He had not long disappeared from view over the horizon when Vedrines, on his Morane, was ready for his turn, taking the air at 7.17. Thus, so far as San Sebastian was concerned, the excitement was finished.

Vedrines, making a good journey, passed over Tolosa at 7.40 and Olasagutia, near Vitoria, at 8.30, and continued on to Quintanapalla, 14 kilometres outside Burgos. Here he found it impossible to rise again without assistance as in landing he had damaged his elevator owing to the roughness of his landing place. He therefore had to travel to Burgos for help to set matters right temporarily. A slight defect in his reservoir also having been repaired, he was then able to take the air again, arriving at Burgos shortly after. Here he deemed it expedient, in order to make repairs quite secure, to ask permission of the organisers at Madrid to delay re-starting until Friday morning, which was readily accorded by the Com-



PARIS-MADRID RACE.—Vedrines' monoplane passing over the Pyrenees.

missaires. In the meantime his arrival in Madrid had been hopefully looked for, a huge crowd having gathered at the official point of descent, patiently waiting to witness the finish of the great race. All fashionable Madrid had turned out to honour the Frenchman, including King Alfonso and his



PARIS-MADRID RACE.—Vedrines' arrival at San Sebastian.

family and other Royal personages. Information arrived of Vedrines having reached Burgos, and when it was announced that permission had been given for him to delay his further journey the greatest disappointment was manifested amongst the huge crowds assembled. But it had to be, and led by King Alfonso's departure, they quietly dispersed under the circumstances. Lieut. Barone and another officer arrived by way of the air during the proceedings, and this in a large measure pacified the impatience of the public and probably unpleasant excitement was thereby avoided.

In the meantime Garros, finding his motor was not working well, came down at Ursibil, about ten miles from his starting point. Starting once more, he was again compelled to alight at Andoain, and return to San Sebastian for a new propeller, then proposing to re-start the following morning.

Gibert passed over Tolosa at 6.53 at a good height, coming down at Olasagutia. Attempting to restart from this place, the fearful state of the taking-off ground upset his machine altogether, putting it completely *hors de combat*, leaving no alternative but to postpone until the next day any attempt at further participation in the race.

On Friday morning early, in spite of the previous day's disappointment, a fair crowd again gathered at the finishing point for the race at Madrid, and this time they were not to be disappointed. Vedrines had got away from Burgos at 5.20 a.m., and safely surmounted the Sierra de Guadarrama Mountains, his route being over the Somosierra Pass. By eight o'clock his Morane-Borel monoplane was sighted as a speck in the distance, and by 8.6 a.m. victory was his, he having landed without further incident at the Getafe Aerodrome, where he was received by representatives of the Spanish Royal Aero Club and Senor De la Torre, the Governor of Madrid, who congratulated him on behalf of Spain and the Government. In passing over the Guadarrama range Vedrines not only had to battle with treacherous gusts and dangerous air-pockets through the mountains, but it was at this stage of his journey that a huge eagle made a direct attack upon his machine. Seeing the fearful danger to himself in this movement as the bird would most likely have come in contact with the propeller, Vedrines instinctively made some sudden and confusing evolutions by dropping suddenly and then rising again, thereby

upsetting the calculations of this very inquisitive bird of prey. For fully five minutes this little sport was in progress between the aviator and the eagle, the acrobatic manoeuvres of Vedrines at last causing the king of the air to abandon his aggressive attack, much to the relief of Vedrines. In like manner Gibert was also the victim of a somewhat similar experience, and he, by means of a revolver, was able to scare his assailant away.

Again, in response to showers of praise, like the sportsmen which have been begotten of aviation, Vedrines gave all the credit of his performance to the makers of the machine, MM. Morane and Borel. At least Vedrines will have the satisfaction of having secured the big monetary compensation, whilst to mark the splendid achievement personally of Vedrines, King Alfonso forthwith decorated him with the Cross of the Order of Alfonso XII. So interested was King Alfonso in the splendid feat accomplished, that M. Vedrines was commanded to attend the Palace, where he had a very lengthy interview with His Majesty, who evinced the greatest interest in the most minute details of the journey, finally pinning the decoration upon the aviator's breast.

The official times for those who started on the last stage are as follows:—

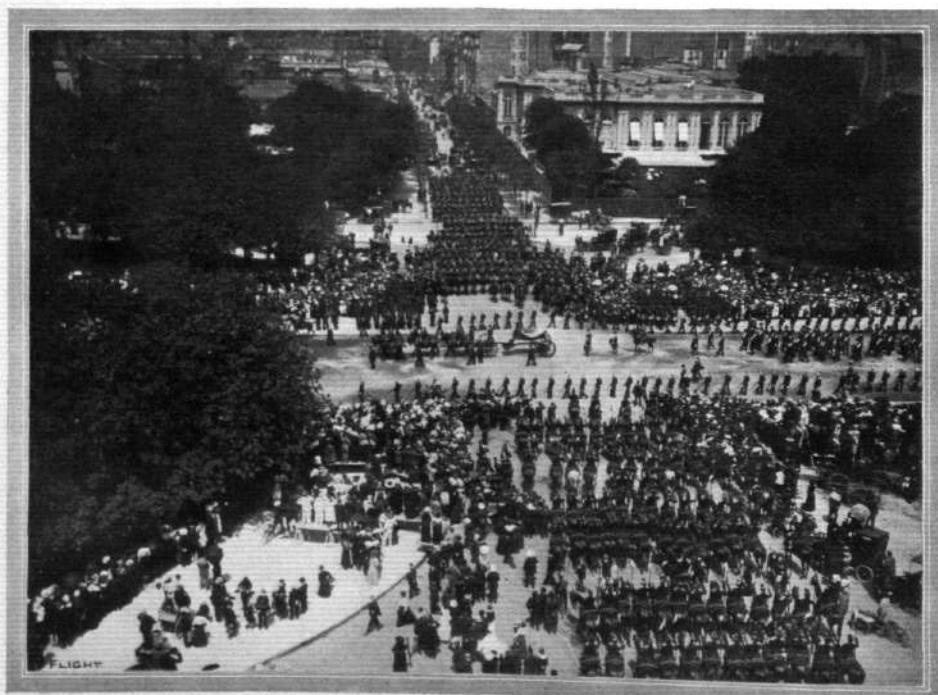
		h.	m.	s.
Vedrines:	Paris-Angoulême	...	4	24 16
	Angoulême-San Sebastian	...	5	56 15
	San Sebastian-Madrid	...	27	5 41
Total	37	26 12

The actual time of flying works out at 14 hrs. 54 mins., not allowing for penalisations:—

Garros:	Paris-Angoulême	...	4	48 13
	Angoulême-San Sebastian	...	6	30 38
Gibert:	Paris-Angoulême	...	28	24 58
	Angoulême-San Sebastian	...	13	42 22

Amongst Vedrines' replies of thanks to telegrams and congratulations upon his great flight, the wording of that to the famous makers of the Gnome engine is very suggestive. It was simply as follows:—

"29,400,000 explosions without a hitch.—Vedrines."



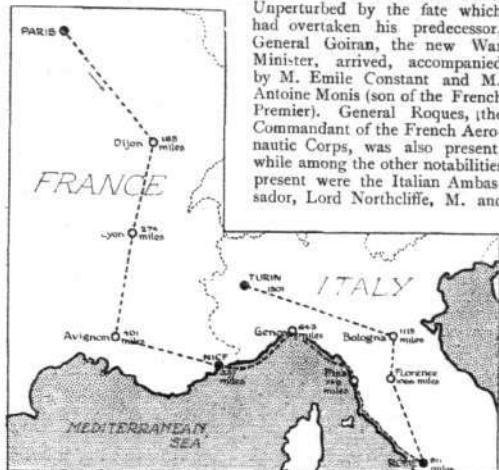
THE FUNERAL OF M. BERTEAUX, THE LATE FRENCH MINISTER OF WAR.—The passing of the coffin and chief mourners and official representatives.

PARIS—ROME—TURIN RACE.

FOR the first time, in many ways, the start of the Paris-Turin race at Buc on Sunday last was more like the get-away of a real race than any flying event which has up to the present taken place. It reminded one somewhat of yacht racing, as the bombs followed one another very rapidly—at times at such short intervals that it was somewhat difficult to know for which machine they were intended as a signal to go. In view of the disaster at Issy, very special precautions had been successfully made with view to protecting the spectators, and it was as well, as a large crowd assembled despite the early hour of the start and the distance from Paris.

Unperturbed by the fate which had overtaken his predecessor, General Goiran, the new War Minister, arrived, accompanied by M. Emile Constant and M. Antoine Monis (son of the French Premier). General Roques, the Commandant of the French Aeronautic Corps, was also present, while among the other notabilities present were the Italian Ambassador, Lord Northcliffe, M. and

Knyff, Etienne Giraud, Schneider, and Count De la Vaulx, and at six o'clock, almost to the minute, a bomb was fired to indicate the official starting time. Within 90 seconds Garros, on his Blériot, was in the air and had flown across the great white line which had been marked on the ground, while, less than a minute after, Lieut. Conneau, who was again flying under the *nom de guerre* of "Andre Beaumont," had started on his Blériot-Gnome, and at intervals of two minutes the rest of the competitors were away—twelve in all. Overnight the judges had sealed thirteen machines, and the only one to fail to start was the Deperdussin, which was to have been piloted by Védrines, who was still in Spain. From the following list it will be seen that two minutes over the hour sufficed to get the twelve competitors clear away, while the ten first were sent off in 16 minutes:



Sketch map of the Paris-Rome-Turin Race.

Mme. Blériot, Capt. Dickson, &c. In addition to the 21 entrants, nine military officers had been nominated by General Roques to follow the event as far as Nice, and so the scene at Buc on the morning of the race was a most animated one. Previous to the start a little diversion was caused by the arrival of the dirigible "Astra-Torres," which had sailed over from Issy, while at half-past five the open exhaust of the motor of an aeroplane was heard, and in a minute or two M. Pommier landed on his biplane, and at six o'clock M. Paulhan arrived, also by biplane. By this time the machines which were ready to take part had been inspected by MM. R. de

	h. m. s.	h. m. s.
Garros (Blériot) ...	at 6 1 28	Weymann (Nieuport) at 6 8 52
Beaumont (Blériot) ...	6 2 9	Level (Savary) ... 6 10 36
Vidart (Deperdussin) ...	6 3 27	Gaget (Morane) ... 6 12 27
Kimmerling (Sommer) ...	6 5 4	Bathiat (Sommer) ... 6 16 47
Manissiro (Blériot) ...	6 7 4	Biélovucic (Voisin) ... 6 44 23
Frey (Morane) ...	6 8 41	Molla (Sommer) ... 7 5 52

The military aviators did not start until the afternoon, when Lieut. Chevreau (Blériot), Lieut. Clavenad (Blériot), and Lieut. Delage (Nieuport) left Buc for Dijon, while Lieut. Lucca, accompanied by Lieut. Hennquin, started from St. Cyr.

Dijon was the first compulsory stop, and a few minutes after eleven "Beaumont" was sighted, and landed at 11.12, being greeted by the Mayor and other local dignitaries to the strains of the *Marseillaise*. He reported that on the way the wind had been very trying indeed, and at times he thought he would not be able to continue. As a matter of fact, he did have to land at Melun, and spent an hour waiting for the wind to go down. Garros, who arrived about ten minutes later, also reported similar weather conditions. So bad was the weather, in fact, that these were the only competitors to get through in the morning, and the large crowds which had assembled to see the flyers arrive became somewhat discontented. They were, however, mollified by seeing Junod make a short flight on a Farman biplane. Meanwhile, reports came through as to the doings of some of the other competitors. Weymann had to descend at Saclay and spend half an hour adjusting his motor, while he also made another stop at Melun. Biélovucic only got as far as Juvisy when trouble with his motor caused him to land, while Manissiro got very little further, and in coming down at Ballancourt he damaged his propeller. Bathiat landed at La Trombe, Level at Bray-sur-Seine, Vidart, Kimmerling, and Weymann all stopped at Troyes, while Gaget, in making an awkward landing at Venarey, smashed his propeller. In addition to "Beaumont" and Garros only two others succeeded in getting through to Dijon on Sunday, these being Molla and Frey, both

PARIS—ROME—TURIN.—Table of characteristics of entered machines.

Pilot and Machine.	Supporting Area.	Weight.			Undercarriage.	Suspension.	Control.			Engine.			Propeller.				
		sq. ft.	lbs.	lbs.	ft.	ins.	ft.	ins.	W & s	S	Pedal	Lever	Gnome	50	7 110 120	Integrale	8 7 5 5 2 1100 72
Niemela (Nieuport) ...	196	750	1100	33	0 27	7	W & s	S	W & s	R	Lever	Bar	"	50	7 110 120	Rapid	8 6 5 4 2 1100 59
Bathiat (Sommer) ...	182	580	900	34	9 29	8	W & s	R	"	R	"	"	Anzani	60	6 105 125	Normale	— 2 — 59
Lemasson (Caudron) ...	235	550	880	26	4 26	4	W & s	R	Wheel	R	Gnome	50	7 110 120	Rapid	8 3 5 4 2 1100 62		
Vidart (Deperdussin) ...	150	495	825	29	8 23	0	W & s	R	Lever	R	"	"	"	50	7 110 120	Integrale	8 3 5 4 2 1100 59
Molla (Sommer) ...	182	580	900	34	9 29	8	W & s	R	"	R	"	"	"	50	7 110 120	Integrale	8 7 5 5 2 1100 59
Beaumont (Blériot) ...	187	505	835	29	4 26	8	W & Wh	R	"	R	"	"	"	50	7 110 120	Integrale	8 7 5 5 2 1100 59
Tetart (Bristol) ...	454	800	1100	34	9 38	7	F	W & s	Bar	Wheel	"	"	"	50	7 110 120	"	9 3 5 4 2 1100 50
Biélovucic (Voisin) ...	342	1100	1590	36	4 34	9	F	Wh	Bar	Wheel	"	"	"	70	7 130 120	Voisin	8 7 6 7 2 1200 62
Lusetti (Morane) ...	187	440	770	30	7 22	1	W & W & s	R	Lever	Bar	"	"	"	50	7 110 120	Integrale	9 3 5 4 2 1100 62
Kimmerling (Sommer) ...	182	580	900	34	9 29	8	W & W & s	R	"	R	"	"	"	50	7 110 120	Rapid	8 6 5 4 2 1100 59
Landron (Autoplan) ...	288	790	1140	36	4 29	8	F	W & s	"	"	"	"	"	70	4 100 160	Integrale	9 10 6 7 2 900 50
Védrines (Morane) ...	187	790	1140	30	7 22	1	W & W & s	R	"	R	"	"	"	50	7 110 120	"	8 7 5 5 2 1100 62
X—(Ch. Joly) (Voisin) ...	450	1100	1540	36	4 34	9	F	Wh	Bar	Wheel	"	"	"	50	7 110 120	Voisin	8 0 5 4 2 1100 50
Level (Savary) ...	555	1210	1540	46	3 29	8	F	W & s	Lever	Bar	"	"	"	70	4 100 160	Integrale	8 10 6 7 2 800 56
Gaget (Morane) ...	187	440	770	30	7 22	1	W & W & s	R	"	R	"	"	"	50	7 110 120	"	8 7 5 5 2 1100 68
Tabuteau (Bristol) ...	454	800	1100	34	9 38	7	F	W & s	"	"	"	"	"	50	7 110 120	"	9 3 5 4 2 1100 50
A. Frey (Morane) ...	187	440	770	30	7 22	1	W & W & s	R	"	R	"	"	"	50	7 110 120	"	8 7 5 5 2 1100 68
Garros (Blériot) ...	187	505	835	29	4 25	0	W Wh	R	"	R	"	"	"	50	7 110 120	"	8 7 5 5 2 1100 59
Prince de Nissolle (Tellier) ...	256	680	1100	39	0 36	4	W Wh	S	Wheel	R	R. E. P. 60	50	5 110 160	"	— 2 — 46		
Weymann (Nieuport) ...	196	750	1100	33	0 27	7	W & W & s	Pedal	Lever	Bar	Gnome	70	7 130 120	"	8 10 6 7 2 1200 78		
Manissiro (Blériot) ...	187	505	835	29	4 25	2	W Wh	R	Lever	Bar	"	"	"	50	7 110 120	"	8 7 5 5 2 1100 59

Notes.—W = Warping. F = Flaps. W & s = Wheels and skids. Wh = Wheels. R = Rubber. S = Springs.

arriving within five minutes of each other just after 7 o'clock. After a short rest, both "Beaumont" and Garros set out to continue to Avignon. A stop was made at Lyon where, during the morning, the large crowd which had gathered to welcome the aviators had been entertained with some fine flying by Legagneux, Hanriot and Beriot. At a quarter past three a telephone message was received to the effect that a monoplane had been seen making its way in the direction of Lyon, and at 3h. 28m. 43s. "Beaumont" glided down easily and gracefully, and was given an enthusiastic reception, as also was Garros, who arrived shortly afterwards at 4h. 2m. 25s. "Beaumont" started off again at 4 hrs. 14 mins., while Garros, after filling up the petrol and oil tanks, &c., was away at 4 hrs. 46 mins. Great disappointment was expressed at Lyon at the non-appearance of the local aviator, Kimmerling, who was delayed at Troyes. At ten minutes to six "Beaumont" was timed passing Monteliar, and at 6.49 he landed at Avignon, while Garros arrived there at twenty minutes to eight. Both aviators then decided that they had got far enough on their journey for one day, and so determined to stay the night.

Of the officers, Lieuts. Clavendad and Chevreau succeeded in reaching Troyes. Lieut. Lucca, after making a stop at Sens, got as far as Tonnerre, while Lieut. Delage came down at Billeneuve-l'Archeveque.

The Second Day.

When the aviators awoke next morning they found the conditions very unfavourable for flying, the sky being overcast and a fine rain steadily drizzling, making things very uncomfortable generally. As there was no sign of any likelihood of improvement at Avignon, "Beaumont" determined not to wait, and got on his way at four minutes to four in the morning, but Garros did not leave Avignon until 5.36 a.m., nearly two hours after his rival had started. Then the weather affected the running of his engine so much that he was forced to make a stop at Mallemort, at the mouth of the Rhone. In descending he smashed both the planes of his machine, but, determined not to throw up until every chance had gone, he at once motored back to Avignon and purchased another machine from Kuhling. "Beaumont" was also temporarily beaten by the elements, and made a stop of six hours at Besse-sur-Issole. He re-started from there at ten minutes to four in the afternoon, and managed to reach Frejus, where he landed at 4.35. About two hours afterwards he was away again, and landed at the Nice California Aerodrome at 7h. 19m. 51s. He was accorded a great reception, and carried in triumph to the hotel. Garros having obtained his new machine set out afresh from Avignon, making a splendid flight to Frejus, where he arrived soon after "Beaumont" had departed for Nice. After only about a quarter of an hour's halt there he was away again in pursuit, landing at Nice at 7h. 57m. 50s.

With regard to the other competitors, Kimerling, with an early start from Troyes at half-past three, reached his native town of Lyon at a quarter-past eight. Stopping for just a little under an hour, he then continued on to Avignon, which was reached a few minutes after noon, a quarter of an hour's stop having been made on the way at Valence-sur-Rhone. He rested for about an hour, and then started for Nice. After making a plucky fight against wind and rain he decided to come down at Brignoles (Var), 65 kiloms. short of Nice. Frey, who had stopped over night at Dijon, started at quarter-past four, and arrived at Lyon about a quarter to eight. He resumed operations about an hour later, and then, losing his way, came down at Valence. While making inquiries he saw Kimerling, who had just started again, pass overhead. At once getting into his machine he set off in his track, gradually overtaking him and reaching Avignon about ten minutes in front of him. Frey then decided to stop for the day. Weymann also started from Troyes, but only got as far as Celles-sur-Ouse, when in coming down he broke his machine so badly as to put him out of the competition. Vidart, who also left Troyes at half-past five, arrived at Dijon at half-past seven, and was off again from there soon after nine. Violent squalls of wind brought him down at Chalons-sur-Saone, but when they moderated he made a fresh start for Lyon. This, however, was not until fairly late in the afternoon, and he appears not to have recognised Lyon, as he was seen making good speed and totally ignoring the aerodrome. As no signs developed of his making any attempt to land, Legagneux and Hanriot set off on their monoplanes and managed to signal the aviator and bring him back to Lyon, where he landed at 6h. 26m. Molla, who had reached Dijon overnight, got away from there at 9 minutes past 5, reaching Arbigny, where he was forced down by solid rain. As soon as this gave over he made a fresh start, but only to get as far as Villeurbanne, where he landed on the racecourse. Unfortunately, he came down rather awkwardly and smashed up one wing of his machine. Manisero's progress was from Ballancourt to Dijon, he making a long stop at Coulmiers-le-Sec on the way, while Bathiat, who went on from La Trombe in the morning, got as far as Romilly-sur-Seine, where owing to motor troubles he determined to stop for the day. Of the other

starters from Buc on Sunday Gaget decided to abandon after reaching Laumes, Bielovucic reached no further than Juvisy, and Level stopped at Troyes. There was, however, a new competitor who, flying over from Juvisy in the morning, had been officially started from Buc. This was Landron on one of the Pischoff machines, on which he managed to get as far as Savigny-sur-Orge.

The Third Day.

At three o'clock in the morning of Tuesday last, "Beaumont" prepared to continue the race from Nice, but his engine refused to work in anything like proper form. The mechanics laboured at it until eight o'clock, and then, although "Beaumont" was able to rise, he decided that it was not wise to proceed, and turned back in order that a new motor might be fitted. Garros, more fortunate, started a few minutes before five, and passing over Oneglia and Albenga, arrived at Genoa at 7.20. He reported that the wind had been very troublesome, while as on the previous day the rain had not added to the comfort of the journey. He had hoped that a new machine on which he wished to continue the journey would arrive by rail, but as this appeared to have been delayed somewhere, at ten minutes to ten he started off on the machine which Leblanc had purchased for him at Avignon. Following the coast line he passed Spezia, and reached Pisa, where he landed at a quarter to twelve. Frey started from Avignon at five o'clock, and arrived at Nice at 8 hrs. 11 mins. and did not get away again until 2h. 30m. 34s. Then he went right through to Genoa, arriving there at 5h. 30m. Vidart left Lyons in the afternoon, and reached Avignon at half-past four. Molla flew over to Lyon in the morning, and at 5.30 started for Avignon. He, however, only got as far as Vienne, where in landing he again damaged his machine, and returned to Lyon by motor car. Manisero made another start from Dijon, but only to get as far as Coligny. Bathiat was away from Romilly at 7.20, and after a descent at Trolois reached Baigneux-les-Juifs, while Kimerling, in trying to start at Brignoles, capsized his machine, and so was detained for the day. Of the officers who took part, Lieut. Chevreau started from Lusigny, and got as far as Dijon, landing at Valsouzon on the way, and Lieut. Lucca went on from Dijon to Lyon.

Fourth Day.

On Wednesday "Beaumont" was the first to arrive at Rome. Garros made a good flight from Pisa, but between Cecina and Castagento his machine fell, and was considerably damaged, but the aviator escaped. Frey progressed as far as San Rossore, near Pisa.



LAST WEEK'S ACCIDENT AT HENDON.

EVERYONE will sympathise most sincerely both with the parents and friends of the enterprising young student who lost his life at Hendon on the evening of Thursday of last week, and also with Mr. Barber, of the Valkyrie flying school, at which he was receiving lessons in the art of aeroplane manipulation. Mr. Bernard G. Benson, of 17, Netherhall Gardens, Hampstead, was only 20 years of age; but for more than two years he had devoted himself heart and soul to the subject of aviation, building a number of models during that time, and following up his schooling at Eastbourne and at Radley by joining the Central Technical Engineering Department of the London University, instead of passing along to Oxford, as had been intended.

For some five or six months he had been taking lessons at Hendon when weather and his other studies permitted; while what makes his sudden death even more sad perhaps than it otherwise would have been was that he took little or no interest in the sensational aspect of flying, and would if necessary have been able to devote an ample fortune to the encouragement of the movement in this his native country. Cool, plucky, sensible and serious, he seemed, in fact, destined later on to become a power in the aviation world in England.

Seemingly, on the evening in question, he was doing considerably better than on previous occasions, making one wide circle after another, at first low down, but gradually ascending. According to all accounts he must have attained a height of some 200 ft., and then he appeared to endeavour to make a *vol plané* with the power cut off. The descent is said to have been shaky from the start, while within some 40 ft. of the ground the machine became completely out of hand and fell headlong. At the subsequent inquest on Monday last, a verdict of "death from misadventure" was returned, while it was intimated on behalf of the parents that they were quite satisfied no blame of any kind could be attached to Mr. Barber. This followed upon evidence which went to show that the height attained was considerably greater than that deemed ideal for all the pupils, and that lack of experience alone led to the actual catastrophe of the moment. That the machine was also in perfect order was proved by the fact that immediately before the accident it had been flown by both Mr. Barber and Mr. Turner.

THE FIRST BRITISH AVIATION BILL.

As we said in our leading article of last week, it is impossible to congratulate the Government upon the first Bill they have seen fit to introduce as a means of controlling the doings of aviators in this country. Panic legislation is never dignified, is often little more than ludicrous; while, as on the present occasion, drastic modification is frequently seen to be desirable by its sponsors even during the brief interval needed for passing the proposed measure and for incurring the wasted time and expenditure. Here is a belated attempt to guard against the imaginary danger of over-sanguine aviators trying to secure popularity and fame by flying over London during the Coronation festivities. Already, the Royal Aero Club had taken steps far more effective than any threatened fine or term of imprisonment to stop any such attempted performance, for it had definitely notified everyone concerned that its own certificates would be cancelled in any cases of the kind in question, and hence that the immediate career of any flying man would be brought to an end rather than standing a chance of being improved by such a performance. Naturally enough, there is a very strong feeling of resentment throughout the whole community interested in aviation, that any such slur should be thrown on the flying men of to-day as is implied by the passing of a Bill of this character. Fortunately the absurdity of it all will be recognised at large when the Coronation festivities are over, and when no single conviction has been obtained or been sought under the Bill; and very possibly when real legislation is required a little later on this first weird attempt may prove to be the means of safeguarding against any like vein of undue haste or of panic.

As originally introduced, this precious Bill was framed as follows:—

1. If any person navigates an aircraft recklessly or negligently, or in a manner which is dangerous to the public, he shall be guilty of an offence under this Act, and in determining whether an aircraft is navigated in a manner which is dangerous to the public regard shall be had to the amount of damage to person and property likely to be occasioned in the event of a mishap occurring to the aircraft.

2. (1) A Secretary of State may, for the purpose of protecting the public from danger, from time to time by order prohibit the navigation of aircraft over such areas as may be prescribed in the

order, and if any person navigates an aircraft or allows an aircraft to be navigated over any such area in contravention of any such order, he shall be guilty of an offence under this Act.

(2) Any such order may apply, either generally to all aircraft or to aircraft of such classes and descriptions only as may be specified in the order, and may prohibit the navigation of aircraft over any such prescribed area either at all times or at such times or on such occasions only as may be specified in the order, and either absolutely or subject to such exceptions or conditions as may be so specified.

3. If any person is guilty of an offence under this Act he shall be liable on conviction on indictment to imprisonment for a term not exceeding two years, or to a fine not exceeding £500, or to both such imprisonment and fine, or on summary conviction to imprisonment for a term not exceeding three months, or to a fine not exceeding £100, or to both such imprisonment and fine.

4. This Act may be cited as the *Aerial Navigation Act, 1911*.

On Monday evening last, when the second reading was moved by Mr. Churchill, some very important alterations were announced, showing clearly a tendency to repent the undue haste with which the measure had been rushed together. Mr. Churchill spoke of the regret that would be felt over anything which would "hamper the development of his vast new science, which the Government believed was fraught with immense consequences to the future of the people of these islands." He repeated that the Bill must be regarded merely as a temporary measure, and that during the next few sessions of Parliament it would have to be followed by more complete legislation. He also notified his willingness to omit Clause 1 in Committee, to confine the penalty to the person actually navigating the machine, and to reduce the penalty to £200 or six months' imprisonment; while he further agreed that a person convicted should have the right to appeal, and be tried by a jury in the usual manner. The Bill was then read a second time without a division, and referred to a Committee of the whole House being finally passed on Tuesday with the amendments specified.

The words "unless he proves he was compelled to do so by reason of weather or other circumstances over which he had no control," were also added at the end of Clause 2.



AIRSHIP NEWS.

The "Navy Dirigible No. 1" Back in her Shed.

GREAT disappointment was expressed on the 25th ult. that, after a three days' airing, the naval airship should have been taken back to the shed. It is stated that some small minor adjustments have yet to be made before the ship will be seen in the air. Some difficulty was experienced in getting the great airship in position to enter the shed, owing to a cross wind, but after about 90 mins. this delicate operation was complete, when 8 mins. sufficed to run the giant dirigible into its shed. The only incident in the operation was the falling of two bluejackets into the dock, but they were

none the worse for their ducking. It is now stated that the airship will not be seen in the open for two or three weeks, and will take no part in the Coronation Naval Review, to which it was anticipated she would make her maiden voyage.

"Clement Bayard IV" Out Again.

THE new Clement Bayard airship was brought out of its shed at La Motte Breuil on the 26th ult., and with eleven passengers on board cruised over Soissons in a most satisfactory manner for an hour and ten minutes.



Photos by Mr. Andrew L. Dennison.

THE WILLOWS AIRSHIP AT LEAMINGTON DURING ITS RECENT VISIT.—As seen through an adjacent orchard, and a near view of the "car," engine, propellers, &c.

THE HYDROGEN BALLOON.

By GRIFFITH BREWER.

THE average father of a family has enough worry with the gas bill, without bothering to reflect that the gas consumed in the house during the winter would be enough to lift himself and his family up into the air as high as Mont Blanc. Fewer still know that if they were supplied with hydrogen instead of coal gas they would be able to add a respectable amount of luggage and their mothers-in-law to the ballooning party, besides doing the thing comfortably in the way of refreshments. Yet in spite of these advantages, from a balloonist's rather than from a householder's point of view, the man who goes ballooning to-day still takes the same large balloon to the gas works and fills it from the common household gas supply.

It is at first somewhat difficult to realise that the air around us has substantial weight—that it actually weighs 75 lbs. per thousand cubic feet. An ordinary schoolroom 50 ft. by 20 ft. and 18 ft. high contains 18,000 cubic feet of air which weighs 1,350 lbs. Now coal gas weighs about 38 lbs. per thousand cubic feet and hydrogen only weighs 5 lbs. per thousand cubic feet, so if one fills an 18,000 cubic ft. balloon, which in itself weighs 400 lbs., with coal gas weighing 640 lbs. (the total weight of balloon and gas being 1,040 lbs.), a net lift of 310 lbs. is secured—this being sufficient to lift one man weighing 160 lbs. with perhaps 140 lbs. of ballast. If, on the other hand, this same balloon be inflated with hydrogen, weighing only 90 lbs., the total net lift is 860 lbs.—sufficient to lift three men, weighing 160 lbs. each, together with ballast to the extent of 380 lbs. It is therefore evident that three men can have a longer balloon trip with hydrogen than one man can have with coal gas in a balloon of equal capacity.

The obvious question that arises therefore is why hydrogen is not always used in amateur balloon ascents, and why when three persons make an ascent together they should take a balloon of 40,000 cubic ft. capacity and fill it with coal gas instead of taking a balloon of 18,000 cubic ft. and inflating it with hydrogen. Everything is in favour of the smaller balloon ; it will lift more with hydrogen than the larger one will lift with coal gas ; it offers less resistance to the wind, so that its descent is easier on a windy day ; it should suffer only half the disturbance in equilibrium of the larger balloon, due to the expansion and contraction of the gas owing to changes of temperature ; it weighs less, and is therefore more convenient to handle and to get to the railway station when brought to rest in the grass field selected for the descent ; and last, but not least in these days of expensive rubber, it requires but about half the amount of fabric in its manufacture. Why, then, is the little hydrogen balloon, so compact and so efficient, not invariably chosen in the place of the great and more expensive coal gas balloon ? The reason that, up to the present, all amateurs have used coal gas, and put up with the attendant disadvantages, is because coal gas can be bought in London at a reasonable price, viz., from 2s. 5d. per thousand cubic feet, whereas hydrogen, not being manufactured there, can only be procured in a compressed state in heavy steel cylinders, brought considerable distances by rail, at £2 per thousand cubic feet. It is, however, manufactured as a by-product of other manufactures in several places some distance away from London, and by taking the balloon to the place of manufacture this splendidly light gas may be obtained at little more than the cost of coal gas.

It is in the hope of starting a new class of hydrogen balloons that one has just been built at Messrs. Short Bros.' Works at Battersea Park, and if other similar balloons are built no doubt the facilities for inflation with hydrogen will be improved. Even now hydrogen may be obtained at a price of 5s. per thousand cubic feet at the Knowles Oxygen Co.'s Works at Wolverhampton, and it may possibly be obtainable at a similar rate at other places in England and also on the Continent. In the future, if many of these little balloons are built, some enterprising firm may start the manufacture of hydrogen in London, and then the popularity of ballooning will be assured.

The building of a balloon of unusual capacity suitable for hydrogen must necessarily be somewhat of an experiment, as the degree of departure from the usual lines of construction appears immaterial. Having decided to build an amateur balloon for use with hydrogen, I therefore introduced several modifications I had long wished to try and which appeared to be of special advantage with a balloon of this small capacity. Those who have watched the tedious process of inflating a balloon, will have seen how the men in charge have to keep working round the balloon, lifting the sand bags and hooking them on to the next mesh of the net lower down, thus allowing the balloon to rise gradually and evenly as the gas enters and distends the fabric. It is necessary to work the sand-bags down evenly, so as to prevent the fabric of the balloon becoming pleated below the net, because if any folds of the fabric

get caught under the net the pressure of the gas holds them tightly against the net, keeping the balloon out of shape, and this irregularity, besides involving the balloon being reduced in size, causes some danger of the fabric becoming torn. Now if this labour of working the sixty or more sand-bags, each of which weighs 40 lbs., could be obviated without danger of unevenly inflating the balloon, a considerable advantage would be secured by reducing labour and increasing the speed of inflation, so with this object in view I decided to dispense with the upper portion of the net, and to attach the lower portion to a fabric band situated round the equator of the balloon. The weight of the car, passengers and ballast, would thus be suspended to the fabric composing the balloon itself, in a similar manner to that employed in dirigible balloons. If it is safe to do this in dirigibles where the fabric not only carries all the weight but also is subject to a certain internal pressure from the gas, it must certainly be safe to employ a similar means of suspension from a sphere where all the strains are equally distributed and where no internal pressure is allowed to accumulate. The circumference of the balloon is about 100 ft., and the total strain with hydrogen is 860 lbs., consequently each foot of fabric is called upon to take a weight of about 8½ lbs. I tested the fabric to 200 lbs. per foot and found no sign of it breaking, so we may feel happy in the fact that the material will stand at least twenty times any strain it is likely to encounter when carrying its party for an afternoon's excursion. This construction also adds a further factor of safety to the balloon, because if, through any remote cause, it became necessary for the balloon to parachute, it would form a parachute equal to its full diameter of 32½ ft., without any tendency for this parachute to roll in, and thus reduce in diameter. The valve employed is also an innovation, it being the new elastic annular membrane valve recently invented by Messrs. Short for use in the Naval airship. The mouth of the balloon is not made with the rigid removable hoop usually employed heretofore, but is limp and permanently attached to the fabric. The net is reduced from 128 meshes at the equatorial band down to 16 leading lines by doubling, and eight carlines coinciding with alternate leading lines carry the car directly from the net through the medium of the hoop.

The practical balloonist will readily recognise the advantages gained by these features for simplifying the construction. In the first place the inflation in calm weather can be carried out without using sand-bags, because the balloon can look after itself and inflate evenly by simply having the gas turned on, while at the same time the details of preparing the car can be carried out. The net cannot get out of position during the inflation, because it only contacts with the side of the envelope below the equator where it is not pressed to any material extent, and therefore cannot grip the fabric, and the pleats which would become formed by this method of inflating an ordinary balloon fitted with a net extending over the upper portion, are entirely avoided. The process of inflation is thus effected with a much increased speed, which is only limited by the speed of gas supply.

On making the descent, the rip cord may be pulled in the ordinary way and the gas is thus discharged in a few seconds, and then instead of having to remove the net, valve, mouth and hoop, it is sufficient to remove the valve and hoop only, and the balloon, net, and mouth can be rolled up into a single pliable package ; whilst the car receives the hoop, valve, grapnel and trail rope. Everything should be ready therefore for loading on the cart in ten minutes instead of about half an hour, which is the time usually occupied in this performance. This saving of time at the descent is of considerable importance, because in addition to avoiding the collection of an inconveniently large crowd, it often means catching the last evening train back to London. Apart from the advantages of these alterations, the main improvement is of course the reduction in size and weight of everything due to the employment of hydrogen gas for the inflation, but even this is, as I have already said, an experiment which adds a special interest to the experience now being gathered at the first ascents.

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Flying to the Assizes.

ALTHOUGH it is true that Mr. Grahame-White was the first to keep an appointment at the Police Court by aeroplane, Mr. Graham Gilmore's trip to Salisbury last week, in order to take his trial at the Wilts Assizes, was of more than passing interest. The aviator left the Shoreham Aerodrome on his Bristol biplane at a quarter to five on Friday afternoon, and at half past six he was at Salisbury. Rounding the Cathedral spire he then flew to the Bristol headquarters on Salisbury Plain, where he landed about 7 o'clock.



The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Committee Meeting.

A MEETING of the Committee was held on Tuesday, the 30th May, 1911, when there were present:—Mr. R. W. Wallace, K.C., in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Col. H. C. L. Holden, R.A., F.R.S., Prof. A. K. Huntington, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, Mr. C. F. Pollock, Mr. A. Mortimer Singer, and Harold E. Perrin, Secretary.

New Members.—The following new members were elected:—Capt. Steele Hutcheson, F. A. C. Leigh, J. T. Musgrave, and W. Oswald Watt.

Aviators' Certificates.—Aviators' Certificates were granted to the following:—

- 89. Lieut. W. D. Beatty, R.E.
- 90. Lieut. R. B. Davies, R.N.
- 91. B. C. Hucks.

"Daily Mail" Second £10,000 Prize.—It was decided to extend the date of entry, without the increased entry fee, up to June 20th. Formal entries, accompanied by the £25, may, therefore, be made by any person up to that date, but the entry form, duly signed by the competitor himself, together with the balance of entry fee, £75, must be received on or before July 1st, 1911.

Flights Over Towns.—The attention of the Committee was drawn to recent flights made by Mr. D. Graham Gilmour over the town of Salisbury, and it was decided to request him to attend before the Committee on Tuesday next, June 6th.

European Circuit.—Mr. G. B. Cockburn and Captain J. D. B. Fulton, R.F.A., were appointed Commissaires Sportifs to represent the Royal Aero Club. These gentlemen will follow the race from start to finish.

The proposed alighting ground at Dover was approved.

Cartographic Conference.—Mr. Griffith Brewer, the delegate of the Royal Aero Club at the Conference held in Brussels on May 26th and 27th, 1911, briefly reported the proceedings of the Conference, full particulars of which will be given later.

An unanimous vote of thanks was passed to Mr. Griffith Brewer on his kind services.

Hurlingham Balloon Contest.—The Committee considered the landing certificates and awarded the cup presented by Lord Llangattock to the Hon. Mrs. Asheton Harbord, who descended nearest the point fixed before the start of the race.

Aerial Navigation Bill.

At the invitation of the Parliamentary Aerial Defence Committee, Mr. Roger W. Wallace, K.C., Chairman of the Club, accompanied by the Secretary, attended an urgent meeting held in the House of Commons on Monday last, and explained the views of the Club on the Bill.

A meeting of aviators and others interested was held at the Club on Tuesday afternoon, the 30th ult. Mr. R. W. Wallace, the Chairman, explained that various amendments put forward by the Club had been agreed to by Mr. Winston Churchill. He wished, on behalf of the Royal Aero Club, to thank the members of the Parliamentary Aerial Defence Committee for the prompt action they had taken in the matter. The Chairman urged all aviators to comply with the Club's prohibition of flying over towns and thickly populated areas.

Lord Montagu suggested that, with the exception of the order as to flying over the Coronation route, orders under the Bill should lie on the table of both Houses for, say, thirty days before coming into operation. This would give ample time for protest if necessary. Lord Montagu hoped to be able to present these views to the House of Lords.

Competitions Committee.

A meeting of the Competitions Committee was held on Wednesday, May 24th, 1911, when there were present: Mr. Mervyn O'Gorman, in the chair, Mr. F. P. Armstrong, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Colonel H. C. L. Holden, R.A., F.R.S., Professor A. K. Huntington, Major F. Lindsay Lloyd, and Harold E. Perrin, Secretary.

Manville £500 Prize.—It was decided, in connection with this competition, that cross-country flights with a passenger should be allowed, provided that such flights are properly observed, both at

the ascent and descent. In this case the passenger must be an observer previously approved by the Royal Aero Club.

Competition Rules.—The drafting of competition rules was proceeded with.

The late Mr. B. G. Benson.

A message of sympathy on behalf of the members of the Royal Aero Club was sent to the relatives of the late Mr. B. G. Benson. The funeral took place on Wednesday last at Brookwood Cemetery, and the Royal Aero Club was represented by Mr. S. T. Medlicott.

Presentations to Club.

Mr. Howard T. Wright has kindly presented to the Club a picture of Mr. T. O. M. Sopwith, winner of the Baron de Forest £4,000 Prize, on the Howard Wright biplane used in his flight from Eastchurch to Thirhooton, Belgium.

Mr. N. C. Neill has kindly presented to the Club a picture entitled "Tableau d'Aviation."

The Institution of Automobile Engineers has kindly presented to the Club Library a copy of its "Proceedings" for the Session 1909-10.

The Manville £500 Prize.

The fourth date for this competition is on Monday, June 5th, 1911. The only flights so far recorded are by C. Howard Pixton at Brooklands, 31 mins., on May 6th, 1911, and 49 mins. on May 20th, 1911, making a total duration of 80 mins.

"Daily Mail" Second £10,000 Prize.

The following twenty-three entries have been notified:—

Theodore Le Martin (Blériot).	Robert Loraine.
André Beaumont (Blériot).	J. Armstrong Drexel.
Gustav W. Hamel (Blériot).	S. F. Cody.
James Radley.	James Valentine (Deperdussin).
C. Grahame-White.	Maurice Durocq.
C. H. Greswell.	

British and Colonial Aeroplane Co.—Six Bristol aeroplanes to be flown by aviators chosen from the following:—Pierre Prier, M. Tabuteau, M. Tetard, E. C. Gordon-England, O. C. Morison, D. Graham Gilmour, and C. P. Pizay.

Universal Aviation Co.—Two aeroplanes (H. J. D. Astley and E. "Smith").

Aeronautical Syndicate, Ltd.—Two Valkyrie aeroplanes (H. Barber and another).

L. Breguet.—Two aeroplanes.

The start will be made from Brooklands on Saturday, July 22nd, 1911, at 3 p.m., and competitors will alight at the Hendon Aerodrome. The aeroplanes will remain at Hendon on the Sunday and the start for Harrogate will be made at 4 a.m. on the Monday morning. Special arrangements for the members of the Club have been made at Brooklands and Hendon whereby members will be admitted free on production of their membership cards. These facilities apply to members only and any friends accompanying members must pay for admission.

Gordon-Bennett Aviation Cup.

The race for the Gordon-Bennett International Aviation Cup will take place at Eastchurch, Isle of Sheppey, on Saturday, July 1st, 1911.

Members of the Royal Aero Club will be admitted free to the special enclosure on production of their membership cards. Special catering arrangements have been made, and large marquees for luncheons and teas will be erected in the enclosures. As a great many members will be motoring down, a portion of the enclosures will be devoted to the garage of the cars, and a route map can be obtained on application at the Club.

Members of provincial Aero Clubs associated with the Royal Aero Club will also be admitted free on presentation of their membership card.

The timekeeping of the race will be in charge of Mr. A. V. Eblewhite.

HAROLD E. PERRIN,
Secretary.

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

NOTE.— Addresses, temporary or permanent, follow in each case the address direct to the Secretary. We would ask Club Secretaries in

FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

Conisborough and District Aeroplane Soc. (18, CHURCH ST.).

ON Saturday, 27th ult., C. C. Allport made a flight of 463 ft. with his double-propeller monoplane thus winning the May monthly prize. This is a record for the club and beats the last record of T. S. Wallis, 405 ft. An aviation meeting is being arranged for Coronation Day when it is hoped the glider will be out.

Dundee Aero Club (3, BALTIK STREET, DUNDEE).

THE glider recently acquired by the club is now assembled, and by the permission of Mr. Geo. Ballingall, Newton, Warmit, Fife, the use of a hill close by St. Fort Station, 10 mins. journey from Dundee, has been obtained. Several glides have already been made. As it is intended to increase the annual subscription from 5s. to 7s. 6d., all interested wishing to join should communicate with the Secretary, c/o Findlay, 143, Nethergate, Dundee, at once.

Scouts' Model Aeroplane Club.

THE 8th Hampstead Troop B.P. Scouts have recently formed a model aeroplane club, of which Mr. C. Grahame-White has consented to become president. Most of their models are biplanes, but the monoplane also has its devotees, although the greatest success has been obtained with one of the former. It embodies several new ideas, which have attracted the attention of famous aviators. One of the principal conditions of entry to the club is that the candidate must have a model in course of construction.

Sheffield Model Aero Club (35, PENRHYN ROAD).

THE model flying competition on Whit-Monday will take place

SCHOOL AERO CLUB NOTES.

By ROBERT P. GRIMMER, General Secretary, British Federation of School Aero Clubs.

SOME remarkably good work is being accomplished by the East London College Aeronautical Society, under the able guidance of Mr. A. P. Thurston, B.Sc., whose name is so well-known in connection with research work. The members meet on two evenings during the week and carry out various experiments on scientific lines. I hope to hear of the formation of similar bodies at other schools in the near future, as scientific research is of the utmost importance to aviation.

The number of schoolboys keenly interested in aeronautics would probably be a revelation to the man-in-the-street. Daily I receive letters from boys all over the country, expressing their keen appreciation of the work of my own club. It is really heartbreaking to read how their attempts to form organisations on similar lines are ridiculed by their school authorities, who in many cases are not merely indifferent but supremely and aggressively hostile. It is to change this bigoted attitude that the British Federation of School Aero Clubs has been formed.

It may not be generally known that M. Paulhan, the winner of the *Daily Mail* £10,000 prize, when a schoolboy was intensely interested in models. Doubtless there are youngsters among us now who, if given advice and encouragement, will more than emulate the exploits of the young Frenchman, whose hobby was model designing and flying.

The model aeroplane is anything but a toy, and if designed and constructed to prove some theory, such as automatic stability, it

The Saxony Circuit.

ON the 23rd ult., ten aviators set out from Chemnitz to fly to Dresden. The first section of this competition, and all of them succeeded in completing this stage. The competitors were Lindpaintner, Laitisch, Lieut. Mossner, Dr. Wittenstein, Jahnow, Buchner, Hoffman, Schauenburg, Kahnt and Grade. Laitisch and Lindpaintner arrived at Dresden the same evening, but Buchner, Grade and Mossner did not get through until the next morning, and Wittenstein, Jahnow and Buchner returned to Chemnitz in order to make a fresh start the next morning. On the 24th, when the King of Saxony was present at the Dresden Aerodrome, Lindpaintner, on his Gnome-engined Farman, accompanied by a passenger, rose to a height of 1,095 metres, thus winning the first prize. The second prize went to Laitisch (690 metres), while Grade (500 metres) was third. The second stage, to Leipzig, was flown off the 26th, and Lindpaintner on his Sommer biplane succeeded in covering the 110 kiloms. in 55 mins. 10 secs., while Laitisch was second in 1 hr. 6m. 55s. Several of the competitors decided, in view of the strong wind, to postpone their departure

names of the clubs, where communications of our readers can be future to see that the notes regarding their Clubs reach the Editor of *FLIGHT*, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

in one of the fields lent by Mr. Brightmore. Competitors should take the Tinsley car from City Terminus and go right to the end of Tinsley Terminus; after leaving the car they should walk straight on for about ten minutes to the Plumbers Hotel, on the right hand side, and then turn up the road for about five minutes walk. A flag pole with the name of the club and a Union Jack will be placed in the field to show the ground. Flying will commence at 2.30 p.m., and competitors are requested to be on the field not later than 2 o'clock. Anyone wishing to enter for the open event may do so on the ground up to 1.45. Entrance for each competitor, 1s. A solid silver medal will be awarded to the winner—the longest flight.

SCHOOL AERO CLUB.

Arundel House School Ae.C. (15, ARLINGTON ROAD, SURBITON).

ON Monday, May 22nd, the latest Mann monoplane of the new "Baby" type was tested at the Hook Aerodrome, and its performances surpassed all expectations. Cyril Ridley has constructed a new model for high-flying, which, together with the original Griffiths monoplane and three Mann machines, will be in evidence at the Crystal Palace on June 7th.

To-day, Saturday, the club is holding a unique model glider contest on Oxsfoot Hill, for which numerous entries have been received.

On Saturday last, the club secretary, Mr. Robert P. Grimmer, was given an extensive passenger flight at Brooklands by Mr. England on a Bristol biplane. Mr. A. Roe is arranging a similar flight for K. F. Mann in the immediate future.

SCHOOL AERO CLUB NOTES.

may be of the utmost utility to the science at large. I deeply regret that there has not been a greater response to the *FLIGHT* prize scheme recently announced. Will my schoolboy readers please take the hint? The following quotation from the *Aeronautical Annual* for 1910 may possibly interest some of them:—"The supreme importance which attaches to the flying model comes from the fact that experiments with it may be made to lessen the number of risks of human life and limb. To say that experiments with models can instruct us concerning automatic stability is almost like stating an axiom. Very much of what is known concerning the disposition of surfaces has been learned from the flight of models. Certainly no experimenter will doubt that there is still much more to be learned. Thus we make a strong plea on behalf of the flying model."

Is flying really dangerous? Personally, I do not think so. Last Saturday I experienced my first flight at Brooklands on a Bristol biplane, piloted by Mr. England. The first minute was certainly exciting, and I cannot but admit that I would have given a good deal to be somewhere else, but after that, the sensation was glorious. The machine was under the most perfect control, and a 15 m.p.h. wind did little to impair the stability. One was able to take notes with perfect ease, and when, after four circuits, the *vol plané* commenced, the time was all too soon. I sincerely wish the headmasters of all the public schools could be induced to make a flight. It would certainly be to the advantage of the school aero club movement.

SCHOOL AERO CLUB NOTES.

until the following day, when Buchner, Kahnt and Grade succeeded in getting through. On Sunday last the third stage was completed to Plauen, and this time Buchner was first in 1 hr. 13 mins., Laitisch being second, his time for the 110 kiloms. being an hour and a half. Lindpaintner, Kahnt and Grade all stopped on the way.

The Upper Rhine Flying Week.

In our last issue we recorded the progress of the first two days of the Upper Rhine Flying Week, and also the unfortunate accident to Laemlin at Strasburg. On the 24th, those who were still left in the competition proceeded to Carlsruhe, landing on the way at Weissenburg. The result of this stage was the placing of Hirth first, Brunhuber second, and Witterstaeter third. Lieut. Mackenthun and Jeannin also succeeded in getting through. The final stage was on the 26th ult., to Frankfort via Heidelberg, Mannheim, and Mainz. At Heidelberg Hirth was the first to arrive, followed within a few minutes by Jeannin and Witterstaeter, and this was also the order of arriving at Mannheim and Mainz. At the latter place the two latter pilots decided to stop and fly for the prizes offered locally, but Hirth continued on, and so won the circuit prize.

FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Flying Ground, Eastchurch.

AT Eastchurch, cross-country flights have become the rule rather than the exception. The Naval officers here have been gradually extending their flights, and the Island having been thoroughly explored from a bird's-eye point of view, the aviators are now extending their voyages over the mainland.

On Wednesday, Lieut. Samson took up the new Short biplane, which was just out of the workshops, and as a trial trip made a flight lasting 45 mins. Finding everything in perfect working order, he again went up, and this time he remained 65 mins. in the air. Towards the latter part of this flight it was getting very dusk, and as a thick mist was gathering over the land, some little anxiety was felt when Lieut. Samson disappeared from view, flying in the direction of the sea. In a short time, however, he reappeared, having had no difficulty in steering by compass which had been adjusted to the machine by Lieut. Gregory.

Lieuts. Longmore, Gregory, and Gerard were also flying at the same time, all making flights of over one hour, whilst Mr. Ogilvie was out on his N.E.C. engined Wright biplane, which appeared to be flying well.

On Thursday Lieut. Longmore tried a run out to Chatham, where he flew round the house of the Commander-in-Chief at the Nore. Throughout the journey he kept at a steady height of 600 ft., and returned to Eastchurch after being in the air 55 minutes. He was followed by Lieut. Samson on Short No. 32, who also negotiated the same course, but kept at a much greater elevation, at times approaching 2,800 ft.

In the meantime, Lieut. Gregory was making a circuit of the Island. Starting at 6.30 p.m. he headed towards the old Aero Club Flying Ground at Shellbeach, and then turning in a north-westerly direction he passed over Leysdown and Eastchurch to Minster. At this point he steered out over the water, and flying about half-a-mile from the coast, he passed round Sheerness, Garrison Point, and Port Victoria. Making up the Medway, he made a circle round his old ship, H.M.S. "Actaeon," which was lying at anchor close to H.M.S. "Leviathan." When close to Garrison Point he was surprised to observe the shadow of another aeroplane thrown on the water, and looking upwards saw at a considerable height above him Lieut. Samson, who was then returning to Chatham.

On Saturday the wind was very gusty at times, the recording anemometer frequently registering a wind velocity of 40 m.p.h. during the day. Towards evening it abated slightly on the ground, and Lieuts. Samson, Longmore, Gerard, and Gregory were all out flying between 7 and 8 p.m., as was also Mr. Alec Ogilvie on his Wright biplane. By timing their speed relative to the ground, the velocity of the wind at 1,500 ft. up was estimated at 34 miles per hour. Mr. Ogilvie remained in the air for some 45 mins., his machine appearing to be almost stationary when head-on to the wind.

Brighton-Shoreham Aerodrome.

THE most notable flight of last week was on Thursday, when Mr. D. Graham Gilmour gave a fine display of airmanship on his Bristol military biplane, during which he made some splendid right-hand turns in practically the length of his machine, afterwards giving an exhibition of switchbacking. He then climbed to an altitude of 2,500 ft., and on coming down, when at 1,500 ft., switched off his engine, finishing with a magnificent *vol plané*, and landing quite easy. Since Mr. Gilmour went to Salisbury there has been very little flying going on here. The aerodrome at present is in the hands of about 100 workmen, putting up new hangars, fencing round the ground, filling in ditches, and erecting grand stands, &c., in view of the aerodrome being one of the stations in the European circuit.

Brooklands Aerodrome.

ON Friday last week there was no flying until the evening, when Mr. Gordon-England was the first out, taking Mr. Poynter for a trip at an altitude of about 400 ft., and finishing with a fine *vol plané*. Mr. Ducrocq was also carrying passengers. Lieut. Beatty made the last flight for his brevet in excellent style, showing perfect control over the Avro biplane.

Flying started on Saturday at 4.30 a.m., the different schools putting in good practice. A puffy wind was blowing throughout the

day. Considerable interest was taken in the Point-to-Point Balloon Race from Hurlingham, eight of the competing balloons passing close over the aerodrome. Mr. Pixton took up the Avro biplane, evidently bent on having a chat with one, but owing to the wind was unable to attain any great height. Later Mr. Kemp took over the machine, and made a pretty flight at a good altitude. Mr. Spencer was making straight flights on the Spencer-Stirling biplane. Lieut. Watkins then brought out the Howard Wright biplane, to which extensions have now been fitted, but owing to the motor not being in its best mood was only able to make straight flights. Mr. Gordon-England took up Mr. Grimmer, of Arundel House School, and flew several circuits. Mr. Fisher finished the evening's flying by giving a pretty demonstration on the Hanriot, banking for his turns in a magnificent fashion.

The schools were again very busy in the early morning of Sunday, until the rising wind put a stop to all flying until later in the day.

In spite of a stiff breeze Mr. Fisher and Mr. Gordon-England were early at work on Monday, both aviators flying over the surrounding country. The wind increasing put a stop to all further flying for the day.

Avro School.—On Wednesday Mr. F. T. Raynham was giving Mr. L. Noel some instructional flights, who afterwards put in some rolling practice, and on Thursday morning was able to make some straight flights. Both in the morning and afternoon of Thursday Mr. Raynham was carrying passengers, and Mr. Marks made several flights totalling about half an hour. On Friday Lieut. Beatty obtained his certificate in great style, doing his figures of eight at a height of 400 ft. He has a neat and clean way of taking his turns, and should prove a very fine flyer. Lieut. Blacher, a new pupil, put in some useful rolling practice. On Saturday, two new pupils, S. V. Letti and S. V. Sippe, were practising, the latter making straight flights. Mr. Roland Kemp took Mr. Letti for 15 minutes' flight in the Avro biplane, and on Sunday morning he carried his brother for several circuits. Lieut. Blacher on Sunday morning also had some lessons, while Sippe and Raynham were making straight flights. Mr. Stanley Adams executed a figure of eight, besides one or two short glides, but found the gusty wind rather troublesome. In the afternoon a nasty gusty wind was still blowing, and nobody appeared likely to venture out, but when about 5 o'clock the wind began to drop, Conway Jenkins took up a passenger on the Avro, intending to make only a straight flight if he found the wind troublesome. However, he rose steadily to 150 ft. and then decided to turn, but while approaching the sewage farm got into the famous down current. In trying to avoid going into the farm he landed awkwardly. The passenger unfortunately was slightly hurt, but both he and Mr. Jenkins came out smiling, and did not seem to at all mind the experience. On looking at the wind gauge during the flight, it was seen that the wind had suddenly shot up to 20 miles an hour and had also altered its course from north-east to north.



The New Judges' Box at Brooklands at the Flying Grounds.—Mr. Eblewhite, the Timekeeper, in the box timing the competitors away to Brighton for the recent race.

Hanriot School.—The past week has been a busy one at the Hanriot school, though owing to the wind most of the flying has taken place in the early mornings, all the pupils showing a marked advance.

During the week Mr. Gordon Bell advanced from the straight flight stage to circular flights and on Sunday, May 28th, was making numerous flights of about 10 minutes duration, including figures of eight at heights up to 200 ft., his landings and turns being carried out in excellent style. On Tuesday, the 30th, the same pupil put up some good flights in a 10 mile per hour wind.

Mr. Jack Humphreys also shows marked improvement and was making short flights nearly every morning, while Lieut. Manisty has advanced to the extent of making long hops.

On Sunday Mr. Perojo flew several circuits and should shortly obtain his certificate.

Mr. Fisher was flying every day, reaching a height of over 1,000 ft. on Tuesday and landing with one long *vol plané*.

Filey School (Blackburn Aeroplane Co.)

DURING the past week Mr. Weiss has put in some good practice on his machine. On Friday Hubert Oxley, who obtained his certificate on a Hanriot at Brooklands recently, was out making several good flights of a few miles each. This is the first time Mr. Oxley has handled this machine, and the fact that he flew straight away speaks well for both man and machine.

On Saturday morning Mr. Weiss was out, and after running up the sands, succeeded in making some good straight flights. Later Mr. Oxley took charge of the machine and did some very pretty flying.

On Sunday morning Mr. Oxley was first away, and delighted the crowd with his clever flying in a rather tricky wind. Mr. Weiss was the next to get up, and his flying was a great improvement on his performance of the previous day. In the evening Mr. Blackburn was out rolling, and the wind having risen considerably he experienced some little difficulty with his machine. He, however, succeeded in making a short flight, which terminated in rather a thrilling finish, as the machine was blown into the sea, and had to be towed out.

Oxley soon followed Blackburn, and his experience stood him in good stead in the air, as the wind was blowing boisterously off the land. The prevailing wind did not, however, daunt Weiss, who went up and handled his machine in a very masterly manner. Weiss is a very promising pilot, of whom more will probably be heard. Darkness closed proceedings for the day.

Mr. Hucks is rapidly recovering from his unfortunate accident, and hopes to be flying again in the course of a week or so.

Freshfield Aerodrome, near Liverpool.

ON Saturday, 20th, Mr. Higginbotham took out his biplane and, accompanied by his mechanic, flew along the coast towards Liverpool and back. Although the wind and weather conditions were not very favourable, he persevered and accomplished many short flights, taking up friends as passengers. The machine is behaving remarkably well since certain alterations have been made. Mr. King was down, but did not take his machine out. Mr. Melly with his pupil (Mr. Jones) came over, intending to take back his 50-h.p. Blériot, which he had left at Freshfield some days previous. He, however, did not like the weather, and left it till the following (Sunday) morning, when he flew it back to Waterloo.

On Saturday, 27th, Mr. Higginbotham motored over from Macclesfield and got to work at once. Taking his mechanic with him he flew to Southport and back, and then gave many friends a few miles flight each, which was greatly appreciated.

On Sunday morning, about 7 o'clock, Mr. Higginbotham was out again, and carrying his mechanic, he made a trip to Altcar, circled the rifle range, then steered across country over part of the town of Ainsdale, thence to Southport, and after circling the pier and marine lake, landed on the shore.

At about 8.30 a.m., Mr. Melly passed the hangars at Freshfield, flying along the coast toward Southport. The two airmen met at Southport and breakfasted at the Victoria Hotel, both returning later to their respective flying grounds, flying at an altitude of about 1,000 ft. At about 7.30 p.m. Mr. King took out his Henry Farman and made a few short flights towards Ainsdale and back.

Liverpool Aviation School, Sandheys Avenue, Waterloo.

ON the 23rd, 24th and 25th ult. no flying was attempted owing to excess of wind. On the 26th Mr. A. Dukinfield-Jones made several straight line flights of half a mile each, and on the 27th in the evening he repeated the performance in a 12-mile wind, showing considerable aptitude in balancing and steering against a nasty cross drift.

On the 28th Mr. Melly had out the two-seater and flew to Southport with Mr. Jones as passenger, total distance 34 miles. On the out-

ward journey he followed the coast line, but on the return journey he took a direct course across country.

On the 30th Mr. Jones made a few short flights before breakfast, but owing to the missing of the engine brought the machine in for examination. Meanwhile Mr. Melly took out the two-seater with Mr. Swaby as passenger, and starting in a northerly direction made a complete circle of Liverpool, via Crosby, Aintree, Wavertree, Aigburth, then crossing the Mersey to Port Sunlight. He then followed the left bank of the Mersey passing over Birkenhead Park and west of Liscard, circled the New Brighton Tower, re-crossed the Mersey and landed opposite the school hangars. The total distance was 35 miles, which was accomplished in the extraordinarily short time of 41 minutes. The average height maintained was 1,000 feet.

London Aerodrome, Collindale Avenue, Hendon.

Blériot School.—Thursday last week was much better weather, though a thick mist prevented any flying taking place before 8 p.m. Mr. G. Hamel brought the two-seater out and flew a few circuits alone in order to test a new propeller; finding it a great improvement, he took up as passengers Messrs. Slack (a new pupil), Dyott, Parr, and later in the afternoon Mr. and Mrs. E. C. Bass, for several circuits, each passenger greatly enjoying the flight in the calm atmosphere.

Meanwhile the school machines were kept busy until very late, Messrs. Henderson and Salmet, who will on the first opportunity go for the qualification tests, describing figures of 8 in the air. Messrs. Seaman and Dyott were making straight flights, while Messrs. Thompson and Slack indulged in some rolling practice.

Late in the afternoon of Friday, Mr. Hamel took up on the two-seater Mr. Weir and Miss D. Clifford, both enjoying their trip immensely. Then Mr. Weir took charge of the helm of a new 50-h.p. Blériot-Gnome of the latest type which Mr. Hamel had also just tried, and though it was his first day on a fast machine, he made two magnificent flights at a height of 600 to 700 ft., landing in perfect style with a neat *vol plané*, a really grand performance for a novice.

On Saturday both Mr. Hamel and Mr. Weir made several flights on the 50-h.p. Blériot-Gnome, Mr. Hamel climbing up to a height of 6,000 ft., and coming down with a fine glide, for which the crowd gave him a rousing cheer.

On Sunday Mr. Weir was out again, flying at a height of 2,000 ft., travelling as far as Harrow and back in the morning.

On Monday the weather was beautiful, but much too windy for school work.

Grahame-White School.—The strong wind was responsible for the suspension of flying and tuition work on Tuesday and Wednesday of last week. Thursday was fine and tuition began at an early hour, Greswell, the chief instructor, taking up the pupils, Keiller-Greig, Alexander Keiller and F. N. Davies, for a quarter of an hour's flight each on the military Farman.

Breakfast over, Clement Greswell with his friend Henderson as passenger made a short cross-country-trip on the military machine. Rapidly climbing until an altitude of 500 ft. was reached, the two set off in the direction of Harrow, passing over that town at a height of 1,000 ft.

After an absence of about half-an-hour they returned to the aerodrome, coming to earth by a graceful *vol plané*.

Sir Arthur Conan Doyle then mounted the passenger seat and was given his first experience in a heavier-than-air craft, expressing himself delighted on his descent.

At 12.30 a monotone buzz indicated the approach of an aeroplane. It proved to be Hubert, who had flown over from Brooklands on one of the school Farman's in the record time for a biplane of 22 minutes.

He distributed, on his arrival, several letters to habitués of Hendon that he had brought by aeroplane from their Brooklands confères. Mr. Chas. E. Liles was given his first lesson on the school Farman, being taken up by Greswell for several laps.

Several passenger flights were given in the evening, Hubert flying with Capt. Marriott and Capt. Pipon, and Greswell with Mr. Victor Yates and Mr. Guy Livingston, Mr. Grahame-White's general manager.

Mr. Grahame-White was flying during the afternoon, taking up with him on one occasion the Hon. A. C. Strutt as passenger. A long flight was made by Clement Greswell on his Gnome-Blériot during the evening. He rose to quite 2,000 ft., and passed out of sight in the direction of Harrow.

There was no flying on Friday. Saturday, the 27th, was very windy, and although it was blowing between 30 and 40 miles an hour in the afternoon, Mr. Grahame-White had one of the Farmans brought out, and flew two circuits on it. The conditions moderated somewhat towards sundown and Greswell took the air on his Gnome-Blériot, covering approximately the same ground as he had

done on the previous Thursday. On his return to the aerodrome he gave instruction to various pupils on the School Farman. Passenger flights were again in great demand, Hubert being kept busy throughout the evening satisfying the desires of would-be aviators. No flying was undertaken on Sunday, Monday, or Tuesday owing to the wind.

Valkyrie School.—The Valkyrie School was very busy indeed on Tuesday last week, nearly all the pupils putting in good practice. Late in the afternoon one of the Valkyrie pilots ascended on the military Type B machine, and although a fresh breeze of well over 20 miles an hour was blowing, he quickly ascended to a height of 1,500 ft., and carried out various evolutions with remarkable steadiness. Descending by means of a spiral *vol plané*, he started the engine before reaching the ground, and executed several more circuits before descending. The wind was extremely gusty, but the machine behaved with remarkable steadiness.

During Thursday morning, although there was a considerable breeze blowing, the Valkyrie pilot took "No. VII" into the air several times, and executed numerous circuits. In the afternoon Lieut. Wells put in some practice, and Mr. Turner, who has lately joined the staff of the Aeronautical Syndicate, was also flying "No. VII." Late in the afternoon the Valkyrie designer ascended to over 2,000 ft. on the new Type B military monoplane, and descended by means of a very fine spiral *vol plané*. Before touching the ground, however, he switched on the engine again, and flew round the aerodrome with both hands above his head. Then rising again to a height of several hundred feet he descended *en vol plané*, alighting in front of the sheds. "Valkyrie II," the big passenger-carrier, was also out, and numerous passengers were given flights. The air then being dead calm and ideal for pupils, Mr. Benson took No. VII machine in hand, and after making a straight flight rose again and began circling the aerodrome very steadily. After four circuits of the ground, and when at a height of 200 ft., he unfortunately decided to descend by means of a *vol plané*, of which he had so far had no experience, the result being the sad and terrible accident which is dealt with elsewhere in this issue. Mr. Benson was one of the most earnest and popular pupils at the aerodrome, and everyone unites in extending their sincere sympathy to his family. The Valkyrie works and school were closed until after the funeral.

Salisbury Plain.

ALTHOUGH the weather on Wednesday of last week was beautiful, there was no flying until the evening, as the Bristol staff was busy getting a new military extension-biplane ready for the Air Battalion. It was tested by Mr. Pizey during a 35-min. spin, the machine rising to a height of 1,500 ft., and behaving splendidly. On Mr. Pizey finishing the trip with a fine *vol plané*, Capt. Fulton took her in hand, and rose for a short test. M. Jullerot was at work with his pupils, and carried six of them in quick succession. Mr. Hotchkiss then piloted the machine, and took another pupil, Lieut. Montefiore, as a passenger, while Mr. Pizey completed the day's



BRITISH NOTES

Date of Entry for *Daily Mail* Prize Extended.

In view of some difficulty being experienced by aviators who are taking part in the International contest in coming to a decision as to whether they will be able to take part in the circuit round Great Britain for the second *Daily Mail* £10,000 prize, the Royal Aero Club has decided to receive entries at the ordinary fee of £25 up to June 20th. At present the entries number 23, including six Bristol machines to be piloted by Messrs. Prier, Tabuteau, Tetard, Gordon-England, Graham Gilmour, O. C. Morison, and C. Pizey; three Blériot monoplanes to be piloted by Lieut. Conneau, Lemartin, and Mr. Gustav Hamel; two Breguet biplanes, a Cody biplane with Mr. S. F. Cody at the wheel; two Valkyries, while other entrants are Messrs. Armstrong Drexel, C. H. Greswell, Robert Loraine, James Radley, James Valentine, C. Grahame-White, M. Ducrocq, H. J. D. Astley, and E. E. Smith."

Great Britain not to be left Behind.

IT is something to learn from Mr. Lloyd George that in view of the developments taking place elsewhere it is impossible for His Majesty's Government to allow themselves to be left behind in the use of the air as well as the land and the sea for the devastating purposes of international war. Mr. Byles elicited this statement in Parliament on Monday, as well as that the Government is not aware of any international movement to forbid the use of aeroplanes or dirigible balloons as weapons of war. Further, His Majesty's Government does not propose to inquire into the disposition of other Powers in this matter, with a view to avoiding the perils and

proceedings by taking up an enthusiast of mature years who greatly enjoyed his experience. Capt. Burke also made several flights during the afternoon. On Thursday the Air Battalion was out early, Capt. Fulton making some good flights. The Bristol School were also in strong fettle all day putting in a good deal of useful work, and Mr. Pizey was testing the Bristol biplane which M. Jullerot used in India, and which at one time belonged to Capt. Dickson. It behaved splendidly, flying very steadily at a height of 1,200 ft., and finishing with a fine *vol plané*. During the evening M. Jullerot and Mr. Pizey made five and six flights with pupils respectively. Capt. Burke and Lieut. Barrington-Kennett were also out on the Army machines. Work started on Friday morning at 5 o'clock, when M. Jullerot commenced his instruction to pupils, while Mr. Pizey soon after took up the tuition. The Air Battalion was also busy quite early. Lieut. Cammel making a good flight on Capt. Fulton's machine, climbing to a height of about 1,000 ft. At 7 o'clock in the evening Mr. Gilmour arrived from Shoreham, and reported having had to fly through rain practically all the way. He mostly kept at a height of about 2,500 ft. The evening was spent in giving instructional flights to pupils, and this work was recommenced at 4 o'clock the next morning when the wind was a little treacherous, and both Mr. Pizey and M. Jullerot found their time fully occupied. At 9 o'clock Mr. Gilmour started off on his machine to fly to the Assizes at Salisbury, and landed in a field only a few minutes' walk from the Court House. He returned again soon after lunch, his presence at the Court not being required until Monday. The arrival of the aviator in Salisbury created a good deal of excitement, and a large crowd surrounded the machine until he started back. The usual school work was indulged in during the evening, and one of the pupils, H. Busteed, an Australian, after doing a couple of straight flights, rose in the air and circled round the camp. M. Jullerot made twenty minutes' flight round the Plain with Mr. Brereton, while Mr. Collyns Pizey flew over with Mr. Pepper to Rolleston Camp where they called at the R.G.A. Mess. After a little refreshment and a chat with the officers, the aviators returned to their headquarters. In all M. Jullerot, Mr. Pizey and Mr. Hotchkiss made nineteen flights during the evening and work finished at 9 p.m. On Sunday a new Renault engine arrived to be fitted in an extension biplane for the Air Battalion. The school was at work during the evening for a short time when the onlookers were somewhat surprised to hear the hum of an approaching aeroplane. M. Jullerot, accompanied by Mr. Pizey, at once got away to meet the visitor, who proved to be Lieut. Cammel, who was bringing the two-seater Blériot over from Basingstoke. He was flying at a height of 2,000 ft. and made a very fine landing. He was also out early on Monday making a flight on the Blériot, while the Bristol school were busy as usual. On Tuesday five machines were seen out, but little flying was indulged in as the wind was very gusty. In the evening, however, the conditions had improved, and the Bristol pupils put in a good deal of work.



OF THE WEEK.

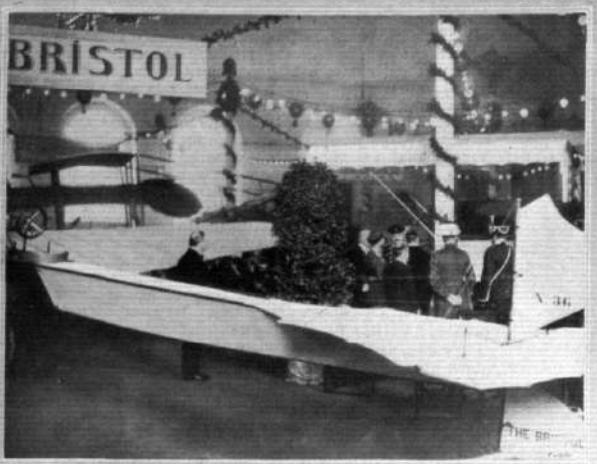
added terrors to humanity which, Mr. Byles suggested, this method of warfare would involve.

The European Circuit.

IT has now been practically decided to abandon Eastbourne in favour of Dover as the landing station for the competitors in this event when they arrive in England. The entry list still continues to mount up satisfactorily, the latest entries to come to hand being five Astra-Wright machines. There are now 39 entries, and it is anticipated that when the list finally closes it will number very little short of fifty competitors.

Mr. Graham Gilmour Again Exonerated.

MOST people would have thought, in view of the verdict at the inquest—when the opinion was that Mr. Graham Gilmour was not to blame for the unfortunate accident to a child of 10 at Wyley—that no police prosecution on a charge of manslaughter would ever have been thought of. Considerable surprise was therefore occasioned in aviation and motoring circles throughout the country when this well-known flying man was arrested at Shoreham—apparently in a most offensive and oppressive manner—nearly four weeks after the occurrence, and the serious charge in question was brought against him. Even now it is difficult to understand why such a drastic step could have been deemed necessary—not to say justifiable—for on Monday last, at Salisbury, he was acquitted by the jury after about ten minutes' consultation and without troubling to leave the box.



The Czar of Russia inspecting the Bristol military biplane of the British and Colonial Aeroplane Co. at the St. Petersburg Aero Exhibition. Mr. H. White Smith, the special representative of the Company, is seen explaining the machine to His Imperial Majesty. This biplane, it will be remembered, not only secured the gold medal for excellence of workmanship, but was purchased by the Russian War Office for the Engineer Corps of the Russian Army.

Mr. Grahame-White Preparing Maps for Daily Mail Race.

In conjunction with the Geographia Publishing and Designing Co., Ltd., Mr. Claude Grahame-White has in hand the preparation of a series of maps for the use of competitors in the European circuit and other important races.

An Echo of the Hendon Demonstration.

ON Tuesday Mr. Grahame-White and the other aviators who took part in the demonstration at Hendon before Ministers and ex-Ministers, &c., were entertained at dinner at the House of Commons.

N.E.C. Engine Acquired by Messrs. Denny.

WE learn that one of the latest New Engine Company's aviation engines have been recently supplied to Messrs. Denny and Sons, the great Dumbarton shipbuilding firm.

Aviators at Lord Northcliffe's Garden Party.

LOCAL correspondents are apt at times to err in details. We learn from Mr. Hubert Latham, who writes from Paris, that he was not one of those present at Sutton Place on the 21st May. Mr. Hewitt, we learn on the contrary, was one of the aviators who made a flying visit upon this occasion.

Mr. Radley at Huntingdon.

ON Thursday of last week Mr. Radley made several short flights on his monoplane at Huntingdon. The new machine he is building, which embodies several details of his own design, should be ready very shortly now.

A Valkyrie at Newcastle.

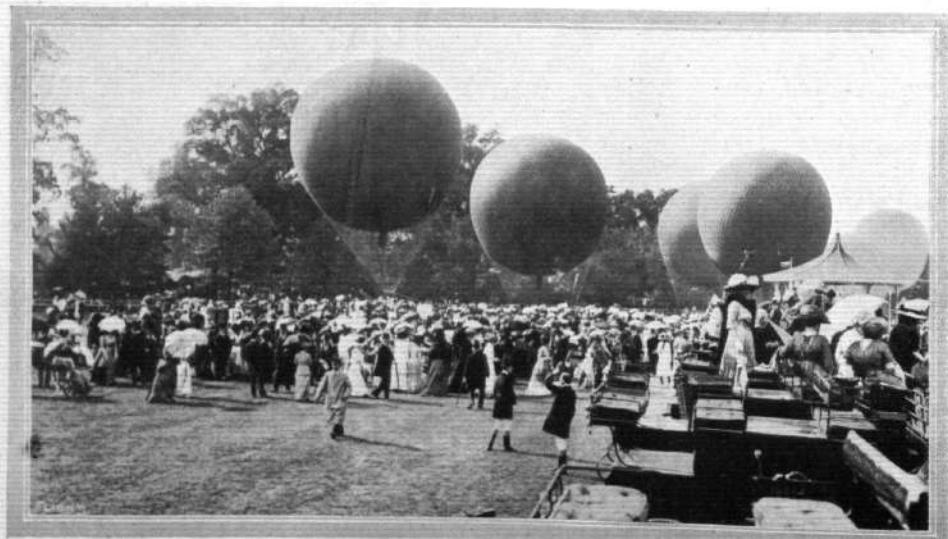
MR. NYBORG has now transferred his Green-engined Valkyrie monoplane to the Boldon Flying Ground of the Northumberland and Durham Aero Club, and on Sunday week made several short flights.

Mr. Sopwith at Philadelphia.

ON May 17th and the three following days Mr. T. Sopwith gave a series of exhibition flights, starting from Point Breeze Race Track, Philadelphia. He was using his Howard Wright biplane, the 60-h.p. E.N.V. engine of which ran without a falter. On one occasion Mr. Sopwith flew over the business portion of the city and circled the City Hall at a height of 1,200 ft., and then coming down to 500 ft. circled round the statue of William Penn. This was the first time this feat had been accomplished, although last year it was contemplated by Mr. Armstrong Drexel, and in 1907 Mr. Beachy passed over the city in a small dirigible. The feats created an immense amount of enthusiasm in the district, and large crowds gathered each day at the racecourse to see Mr. Sopwith fly.

Mr. Gustav Hamel to Visit Warwick.

ARRANGEMENTS have been made by the Universal Aviation Co., Ltd., 166, Piccadilly, for Mr. Gustav Hamel to visit Warwick on Whit Monday, and, weather permitting, he will fly round the Castle from the Yeomanry Camp.



ROYAL AERO CLUB BALLOON CONTEST AT HURLINGHAM.—General view of the balloons in readiness for the start on Saturday last.

THE VORTEX PRINCIPLE OF FLIGHT.

By T. A. DRING.

BRIEFLY stated, the problem of flight is the problem of propelling a heavy body in the atmosphere in both horizontal and vertical planes, whilst preserving its longitudinal and lateral stability.

The factors to be considered are four, viz. :—

- A. Constant force. Gravity.
- B. Variable force. Application of laws of motion.
- C. Solid body. Bird, insect, or flying machine.
- D. Gaseous body. The air.

Gravity admits of no control, nor does it admit of any neglect. At every step its presence must be recognised, and the fact that its power varies only with the "mass" of the object to be sustained, regardless of its size and shape.

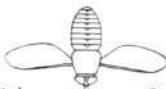


Fig. 1.



Fig. 2.

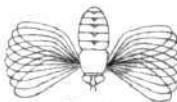


Fig. 3.



Fig. 4.

Figs. 1 and 2.—Gadfly at rest, wings extended and wings closed.

Figs. 3 and 4.—Plan and front view of gadfly suspended in air, wings in motion.

The laws of motion can be applied in two ways :—

- E. Motion of translation, or motion in a straight line, and
- F. Motion of rotation, or motion round a central point.

Both these forms of motion can be applied to the two bodies, C and D.

All existing flying-machines of the heavier-than-air type depend, like their prototype the bird, upon motion of translation; translation of the machine itself by progression through the atmosphere, and translation of masses of air through the operation of wings or propellers. Motion of rotation is used in only one of its two possible applications, namely in rotating a solid body (the propeller), for the purpose of procuring motion of translation of masses of air. No attempt has yet been made, so far as the writer is aware, to employ motion of rotation of masses of air, and yet it is by this application of the laws of motion that Nature produces her greatest demonstrations of force, the whirlwind, the waterspout, and the cyclone.

Just as motion of translation applied to masses of air produces a reaction in the contrary direction, so must motion of rotation, and if use can be made of the first-named reaction for purposes of mechanical flight there would seem to be no reason why the second should not also be used. How Nature employs it in the flight of certain insects will be shown.



Fig. 5.

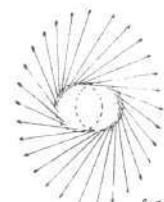


Fig. 6.

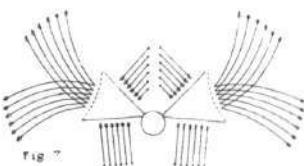


Fig. 7.

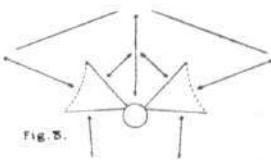


Fig. 8.

Fig. 5.—Vortex. Inflowing currents of expanded air.

Fig. 6.—Vortex. Outflowing currents of compressed air. Fig. 7.—Insect suspended in air. Front elevation, showing course of air currents. Fig. 8.—Reactions to air currents shown in Fig. 7.

The flight of all British birds depends upon motion of translation, and may be classified under three heads :—

A. Gliding flight.—Motion of translation of the body of the bird only.

B. Flapping-wing flight.—"A," combined with motion of translation of masses of air due to the action of the wings.

C. Soaring flight.—Natural motion of masses of air (*e.g.*, wind), the bird sustaining itself by balancing the force of gravity against the kinetic force of the wind.

A close study of flying insects reveals the fact that Nature in their case employs not only motion of translation, but also motion of rotation of masses of air, which she never does in the case of birds, save perhaps the humming-bird.

The flight of insects may be classified as follows :—

A. Gliding-flight.—Confined to the grasshopper, so far as the writer is aware. This is but little seen in this country, but it is extremely common in the Swiss and Austrian Alps.

B. Flapping-wing flight.—The commonest form. The flight of butterflies and of most of the British moths.

C. Rotary-wing flight.—Nature's complete solution of the problem of flight. The principle employed by hawk-moths, bees, flies, and beetles.

If "A," which is the rudimentary stage for both birds and insects, be eliminated, all insects, for purposes of flight, fall into two groups, which represent respectively the two forms of motion, *viz.*, motion of translation and motion of rotation.

Flapping-wing flight.—Insects using the reciprocating or flapping wing possess four wings, of very large area compared with the body. The fore-wing on each side of the body has a considerable lateral motion, as well as a very extended radius of action in the vertical plane. On the down stroke the fore and under wings are fully extended, and the thrust against the air is backwards as well as downwards, giving a propulsive and a lifting reaction. On the up-stroke the fore wing slides back above the under wing, thus reducing the total area of

the wings, and, consequently, the force of the upward thrust and its reaction. The up-stroke, however, assists in the forward propulsion. The path described by the front edge of the fore wing is thus an ellipse, the long diameter varying in length with the sweep of the wing in the vertical plane, whilst the short diameter represents the lateral motion. Each surface of the wing, alternately, is followed by a stream of expanded air, due to a partial vacuum, and preceded by a cushion of compressed air, the filaments of the latter which lie next the wing expanding and flowing round the edges to join the current of expanded air at the back. There is thus a constant flow of compressed air from the front to the back of the wing, and it is the creation and carrying forward of this cushion of air which produces the reactions upon which the flight of the insect depends.

Increase of speed in the flapping of the wings tends to reduce the radius of action in the vertical plane until, with certain insects, a point is reached when the ellipse becomes a circle.

The substitution of a circular for a reciprocating motion renders the sliding of the fore wing over the under wing no longer necessary for purposes of flight, and Nature, following her invariable rule, proceeds to suppress the useless member. In the humming-bird hawk-moth, one of the four-winged insects employing rotary wings,

the size of the under wing is considerably less than that of the fore wing. In bees and wasps it is but half the size, and it has lost its power of independent motion and acts as if it were part of the fore wing. In the humble-bee the under wing is so small that it easily escapes observation. In flies the under wing has disappeared altogether, nothing but stumps remaining to indicate its former existence.

Rotary-wing flight.—The gadfly (Figs. 1 and 2), an insect resembling a small wasp in appearance, is familiar to everyone. Poised in the perfectly still air of a hot summer's day (Figs. 3 and 4), its motionless body suspended, as it were, by an invisible thread, the wings a mere blur from their rapid motion, it is obviously employing some different principle of flight to that of the butterfly, or the little fluttering four-winged moths of its own size, whose bodies are in a state of constant vibration, and which are never seen to take up a position of poise. The feeble, jerky movements of the latter are a contrast in every way to the beautifully smooth and powerful movements of the fly.

The gad-fly weighs from five to six hundred times the weight of the air displaced by its body. It can turn sharply, as on a pivot passing through its thorax, it can dart backwards, and it can shoot forwards at a speed that the eye cannot follow. It can rise and fall in a directly vertical line, and, at any point in its career, it can instantly stop its forward motion and resume its position of poise. Its relative, the house-fly, saunters to and fro in the air without any

the bird and from insects employing the flapping wing, the speed of whose flight is directly related to the rapidity of movement of the wings.

Mechanical application.—The wing employed by the fly to produce vortex and whirlwind currents is a lever of the third order, and wonderful as are the results obtained, the device is not one that can compare with the wheel and axle. Its efficiency is reduced by the

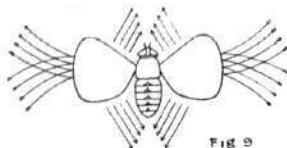


Fig. 9

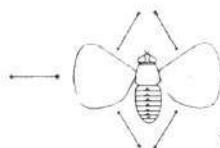


Fig. 10

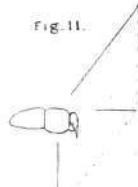


Fig. 11

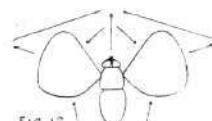


Fig. 12

Fig. 9.—Plan of insect suspended in air, showing direction of air currents. Fig. 10.—Side view, showing the resultant of reactions in forward flight. Fig. 11.—Side view, showing the resultant of reactions in forward flight. Fig. 12.—Plan of reactions in forward flight.

apparent effort, suddenly darts forward to meet another fly, waltzes round at a high speed for a moment, and again resumes its leisurely motion. The wasp, whose flight depends upon the same principle, has a lifting power equal to twice its own displacement in water. These insects have complete command of the air, in every possible sense of the word, by a principle which needs none of the delicate adjustments involved in flight by motion of translation, and which lends itself to application by modern machinery even more readily than it lends itself to the mechanism of the insect—the muscles and wings.

The wings of flies, bees, and wasps do not flap or vibrate, but rotate. The front and back edges of each wing describe intersecting

necessity of feathering the blade at two points in each rotation, and a high velocity is required. The reproduction by mechanical means of the wing movement having proved conclusively the soundness of the theory just described, experiments were made with revolving shafts to which vanes of various descriptions were attached, with the object of producing similar currents that might be used for purposes of flight. The shape of the earlier vanes was a rough copy of the insect's wing, but quite recently a series of experiments has been carried out to determine the best shape and angle of inclination of the vanes, and for this purpose a start was made with simple geometrical forms, such as the parallelogram, the right-angled triangle, and the obtuse-angled triangle. It was found that the

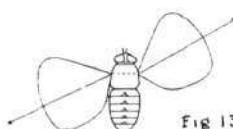


Fig. 13



Fig. 14

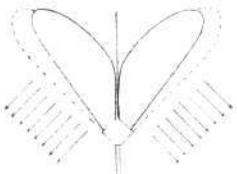


Fig. 15

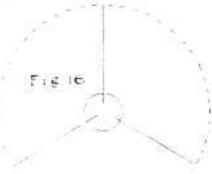


Fig. 16

Fig. 13.—Plan of insect, showing formation of couple by tilt of wings in opposite directions. Fig. 14.—Plane showing the result of turning moment produced by couple. Figs. 15 and 16.—Vortex propeller in elevation and plan.

cones of about 45°, the apices of which are co-incident with the root of the wing at its junction with the body. The effect of this motion upon the air is the creation of a vortex, the air stream which formerly followed the reciprocating wing in a more or less straight line, being now drawn in at and above the tip in the form of a funnel or hollow cone with a spiral motion. The air cushions, which formed in front of the reciprocating wing, and flowed to the back, now form an air stream driven outwards by centrifugal force, and fed by the inflowing stream passing through the vortex. These outflowing currents are driven off at a tangent to the circle of rotation, and at an obtuse angle to the axis of rotation, forming a truncated cone or ellipse. The reactions to the discharge give a resultant force in the line of the axis of rotation.

In flight this axis is inclined upwards at an acute angle, and the resultant forces, acting in an outward direction along the axes of the two rotating wings, become the components of a second resultant giving a vertical lift.

In the horizontal plane the insect retains its position by the perfect balance of the currents discharged in a forward and backward direction respectively (Figs. 9 and 10).

But the insect can readily vary the angle which the axes of the rotating wings make with the body, either vertically or horizontally. By a slight tilt of the wings in the horizontal plane it can obtain a third resultant force giving a backward or forward motion combined with the vertical lift (Figs. 11 and 12). By inclining the axes in opposite directions a couple is produced giving a turning moment about a point in the centre of the thorax, enabling the insect to steer to the right or left (Figs. 13 and 14).

The movement of the insect in the horizontal plane depends entirely upon the angles made with the body by the two axes and the resultants obtained therefrom, and does not necessarily vary with the speed of rotation of the wings. It differs in this respect from

latter was incomparably the best form, and from this has been evolved the shape of vane now adopted.

Figs. 15 and 16 show in elevation and plan a Vortex propeller, of which several types are covered by the original patents and the patents of addition. The essential features of this propeller are the outline and angle of inclination of the vanes, and the fact that the vanes are perfectly flat. The propeller illustrated is composed of a

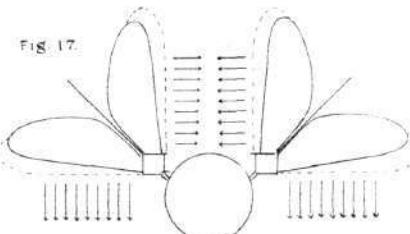


Fig. 17.—Application of two vortex propellers to a flying machine—section amidships.

system of three vanes set radially upon a conical hub attached to the end of a revolving shaft. The model has been thoroughly tested with perfectly satisfactory results. Compared with a single vane rotating in the manner of a fly's wing at 1,000 rotations per minute, the propeller with three vanes of similar size revolving at the same speed gave results estimated as being from ten to twelve times as efficient.

The freedom from vibration or " flutter " of both devices was very remarkable, due to the fact that the centrifugal force set up in the substance of the vanes followed the lines of force of the discharging currents of air, and consequently was exactly opposed to the reaction thrusts. In the screw-propeller the lines of centrifugal force acting upon the blades are at right-angles to the air currents.

One important fact ascertained from the experiments with the Vortex propeller was that the currents discharged from the Vortex not only leave at a tangent to the circle of rotation, but always take a course at *right angles* to the outer edges of the vanes. The discharged currents, therefore, form a truncated cone, the angle of which is determined by the angle of the inverted cone formed by the revolving vanes. The most efficient angle for the purpose for which the propeller will be used is a cone of 90°, producing a truncated cone of similar angle for the discharging currents. The reactions against the latter thus give a thrust at an angle of 45° with the axis of rotation.

As the vane system is symmetrical the thrusts of the reaction are also symmetrical, and the rectangular components of such thrusts may be expressed as follows, where N represents the number of vanes, and P the thrust on each :—

$N \cdot P \cdot \cos \theta$ = the net resultant of the reaction thrusts along the axis of the shaft, which is relied upon for propulsion.

$N \cdot P \cdot \sin \theta$ = a multitude of couples giving a turning moment in opposite direction to the motion of the shaft itself. The resultant of

the turning moments acting upon the shafts of the two Vortex propellers shown in Fig. 17, when revolving in opposite directions, would apparently be a turning moment tending to rotate the body of the machine in the vertical plane about a horizontal axis some distance above such body. This moment would be neutralised by the formation of another and opposite turning moment due to the position of the centre of gravity of the machine being below that of the metacentre.

It is obvious that, if each Vortex propeller be regarded as an isolated unit, without reference to the force of gravity, the value of the $\cos \theta$ resultant will not be affected by any inclination of the axis in either the vertical or the horizontal plane, and that when applied in opposition to gravity its maximum value will be when the axis is vertical. But in the application to a flying-machine of two such Vortex propellers revolving in opposite directions, the position of maximum efficiency will be that where the axes of the two propellers are inclined upwards at 45°, as shown in Fig. 17, where the body of the machine is represented in section by a circle.

Like the wing of a fly, the efficiency of the Vortex propeller increases with the angular velocity of the vanes. Owing to the small size of the fly's wing a high speed of rotation is necessary to obtain the required angular velocity. The much greater length of the vanes in the case of a full-sized Vortex propeller would, it is computed, render unnecessary a higher speed than 300 or 400 revs. per min.



FOREIGN AVIATION NEWS.

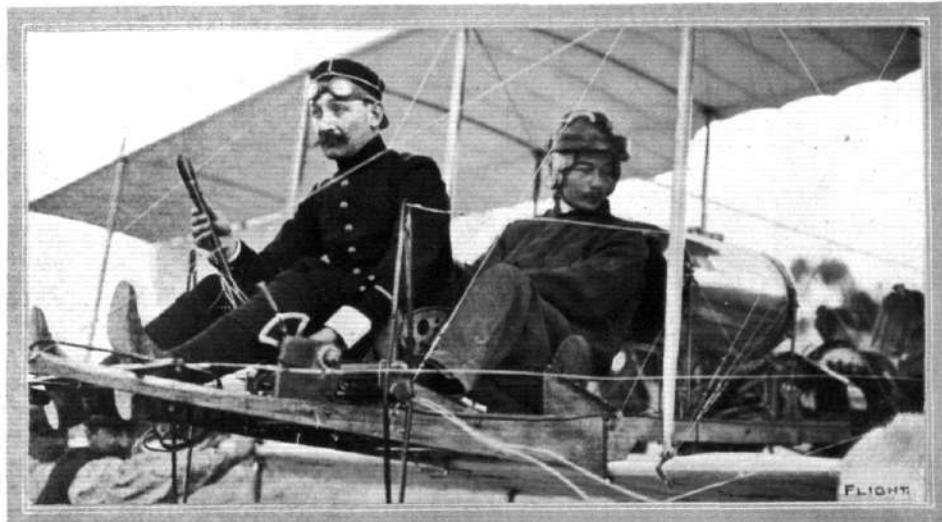
Lieut. Menard's Tour of France—Passenger Record Beaten.

AFTER being delayed for some days by bad weather, Lieut. Menard was able to commence his long projected 3,000 kilom. tour around France on the 25th ult. Accompanied by Lieut. Do Hu, he started on his Henry Farman from Bouy at five minutes to three, and at a quarter to six, after having covered 238 kiloms. in 2 hrs. 50 mins., he landed at Chartres at a quarter to six in order to take on board more petrol. At a quarter past seven Vendome was reached, and a landing was decided upon in order to inspect the motor, which was not working at all well. Two hours and a quarter were, as a matter of fact, spent in making adjustments, and it was not till half-past nine that the aviators were in the air again. Chatellerault was passed about midday, and at a quarter past twelve a safe landing was made at Lacleuf, close by Poitiers. The journey was a record one, and the last portion beat the world's records for a flight with passenger. The total distance covered during the morning was 600 kiloms.

In consequence of some repairs being necessary, the journey was not resumed until Saturday last, when the two aerial voyagers, after fitting a new motor to the machine, left Poitiers for Rochefort-sur-Mer, which was safely reached after about an hour and a half's flying. Lieut. Menard and his companion were to have continued their journey on Wednesday to Pau.

America and the Gordon-Bennett Cup.

It is now practically certain that Weymann will be one of the U.S.A. representatives in the competition for the Gordon-Bennett Cup, and he will use a Nieuport monoplane. Another likely starter is Earle Overton, who has been making some good flights in America on a 70-h.p. Gnome-Bleriot. The name of Mr. J. V. Martin, who until recently was at Hendon, has also been mentioned, while the American Aero Club is asking American citizens at present in Europe studying aviation to communicate with them, with a view to being included in the team.



ROUND FRANCE BY MILITARY AEROPLANE.—Lieut. Menard and his passenger, Lieut. Do Hu, who, on a military Henry Farman, is making a tour round France. On his first day's flight he easily beat the world's record for passenger-carrying across country.

Madame Niel has a Fall.

WHILE flying on her monoplane in the neighbourhood of Gaillac-sur-Tare, on the 20th ult., Mme. Marthe Niel failed to negotiate a gust of wind, with the result that the machine fell to the ground. Mme. Niel sustained some bruises and had her face somewhat cut, but she made light of these injuries, which fortunately are not serious.

Flying by Compass at Nice.

By way of testing a compass which he has arranged and fitted to his machine, Lieut. Bague on the 23rd ult., left Nice and flew for twenty minutes straight out to sea. Turning, he made his way back by the aid of the compass, and landed safely at the Brague aerodrome.

A Long Trip on a Savary.

ON a Savary biplane, fitted with a Labor motor, Level was flying for one hour at Chartres on the 24th ult., and also travelled from Chartres to Voves and back at a height of about 1,100 metres.

The Six-bladed Deperdussin.

CONTINUING his tests with the Deperdussin monoplane, fitted with a six-bladed propeller, Vidart, on the 25th ult., flew from Courcy to Mourmelon and back in 37 minutes, attaining a speed of over 100 k.p.h.

International Map Commission at Work.

ON the 26th ult. a conference representative of the nineteen countries belonging to the Federation Aeronautique Internationale, met at Brussels to consider the question of a map for aeronautical purposes. Prince Roland Bonaparte presided, and Great Britain was represented by Mr. Griffith Brewer. It was decided to adopt a uniform scale of 1 in 200,000 for aeronautical maps, and to divide the map sheets, degree by degree, according to the parallels of latitude and meridians of longitude.

From Paris to Luneville.

LEAVING Vincennes at half past three on Sunday morning, Lieut. De Rose landed on the Luneville Parade Ground at ten minutes past ten. A stop of twenty minutes was made at Chalons-sur-Marne, and during the first part of the journey the pilot, in view of a troublesome wind, kept his machine at a height of about 1,200

**POINT-TO-POINT**

THE first point-to-point balloon race of the season was held by the Royal Aero Club on Saturday last from Hurlingham, when eight balloons started off to try and reach Challow Station on the G.W. Railway near Wantage, which it had been decided just previous to the start should be the objective. A few minutes before four the first balloon was officially started away by Messrs. Mervyn O'Gorman and Roger W. Wallace, this being the "Pompadour," piloted by Captain E. M. Maitland and carrying Miss Maitland and Mr. and Mrs. Carlyle as passengers. At brief intervals seven other balloons were timed away in the following order: "Hanover," Herr C. Stollwerck, with Dr. Glanz, Herr K. Schmidt and Herr L. Frese; "Banshee II," Mr. John Dunville, with Capt. B. Corbet, Capt. B. Chester, Mr. Philip Gardner, and Mr. Armstrong Drexel; "Dunlop I," Major Sir A. Bannerman, R.E., with Captains Ellington, H. Wake and Massy; "North Star," Mrs. Assheton Harbord, piloted by Mr. C. F. Pollock, with the Hon. E. Brabazon and Mr. L. M. McKinnon; "Uranus," Mr. A. P. Hohler, who was accompanied by Mrs. Hohler; "Mercury," Capt. the Hon. Claude Brabazon, with Capt. L. R. V. Colby; and "Corona," Capt. E. F. F. Sartorius, with Messrs. W. S. Pilcher and E. D. Ridley as passengers. At the start there was an easterly breeze, but this dropped later, and none of the competitors got very close to the finishing point, the nearest being the Hon. Mrs. Assheton Harbord's "North Star," which came down at Upton, near Andover, 22½ miles from Challow, and this performance secured the Llangattock Cup. The second place went to Capt. Sartorius, who brought down the "Corona" at Home Farm, Micheldever, near Winchester, 34½ miles from Challow. The contest for third place was a very close one—between "Mercury" and "Banshee II," both landing near Winchester, the former three-quarters of a mile

metres, but in the second part he was rarely above 500 metres. He passed over Luneville at a height of about 100 metres.

Two Further Fatal Accidents.

THE end of last week saw two further fatal accidents to aviators, one at St. Petersburg and the other in Italy. The first occurred on Saturday, the opening day of the St. Petersburg meeting. After a forty minutes flight, Vladimir Smith, a British subject, was descending, when the aeroplane, a Sommer biplane built at the Russo-Baltic Works at Riga, fell from a height of 150 ft. The aviator died while being conveyed to the hospital. It is said that he was descending at full speed, when the machine apparently got out of control. It has also been stated that the accident was due to the inexperience of the aviator. The Italian fatality happened to Cirro Cirri, who fell from a height of 600 ft., while giving an exhibition flight at Voghera.

Olieslaegers and the Dutch Height Record.

ON the 25th ult. Olieslaegers, at Winschoten, succeeded in beating the Dutch height record by rising to 1,150 metres. While at that height he also flew over the town. Two days previously he made an excursion of 40 miles to the German frontier and back.

New German Height Record.

USING a Grade monoplane, Schall, on Sunday last, at Johannisthal, succeeded in rising to 2,150 metres, thereby beating the German height record.

A Friend in Need.

WHILE flying his Breguet biplane at Douai on the 25th ult. Debussy lost his propeller, but fortunately was able to glide down from a height of 200 metres and land on the open ground. Hearing of his predicament, M. Breguet himself flew over with a new propeller, and after fitting it the two returned in company to La Brayelle Aerodrome.

Tests with a Breguet.

DURING a series of demonstration flights at Douai before a French military commission, M. Breguet succeeded in attaining a speed of 100 k.p.h. while flying with four passengers on his machine. Blanchet, on a similar aeroplane, flew over the town of Douai.

**BALLOON RACE.**

further on than the "Corona," while the latter was only a quarter of a mile further away. Of the other competitors, the "Hanover" landed at Northington, 36½ miles from Challow; "Pompadour," near Bisley, 39 miles; the "Uranus" at Binsted, 41½ miles; and the "Dunlop I" near Godalming, 44½ miles.



ROYAL AERO CLUB BALLOON CONTEST AT HURLINGHAM.—
Mr. Dunville's "Banshee II" pulling well for the start.

CORRESPONDENCE.

* The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

Correspondents communicating with regard to letters which they have read in FLIGHT, would much facilitate ready reference by quoting the number of each such letter.

Power for Flight.

[1197] In reference to some of your most interesting articles on the problems of flight, the following considerations puzzle me a little, and I do not like the fashion of getting away from the real question by saying that birds are living creatures and therefore excel machines. This is not so with the horse and the cycle or motor. According to the figures of Langley and others 50 condors or 100 wild geese, if all on a string, could support and carry a man in the air—the whole lot exerting a force of about 2½-h.p.

Similarly with 30 or 40 golden eagles, according to the accounts of naturalists, who tell us they can lift 5 or 6 lbs., or even much more.

What puzzles me is that this should be so, though our best models of the size of the bird are so inefficient and though we are told that the small machine is wasteful as compared with the larger. Certainly propellers of small diameter are inefficient. Yet here we have something in the nature of a propeller which though small yet can give thrust. In fact the 30 eagles represent 30 propellers and 30 small planes with all the theoretical increase of friction and waste of power.

Now a single machine or bird of equal power with the team above-mentioned would have a high starting, landing, and flying speed. So the conclusion that I am faced with is that for easy management a team of six ft.-span models would be better than a single full-size plane! This looks absurd. However, there is one practical conclusion I draw. We are too modest about our models. We are shy of putting in weighty engines.

The wild goose has an area of 27 sq. ft., a weight of 9 lbs., an estimated h.p. of 0·026, and gets along unaided; while the condor, with a maximum span of 10 ft. and an area of 10 ft., weighs 17 lbs., and exerts up to 0·05 h.p. (Langley's figures). Even heavier is the trumpeter swan—28 lbs., with a span of 8 ft., so there is lots of room for our model makers to improve the efficiency of their planes and propellers, while they need not be looking for 1½-h.p. engines weighing 3 lbs. complete. Nor need they put all the blame on head-resistance, as even a small kite or eagle can fly with a rabbit in its talons.

A. F. M.

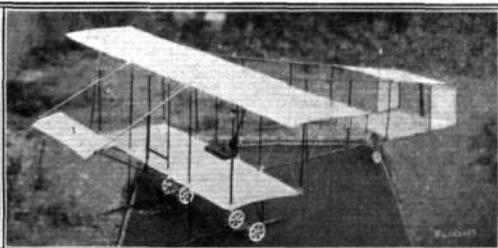
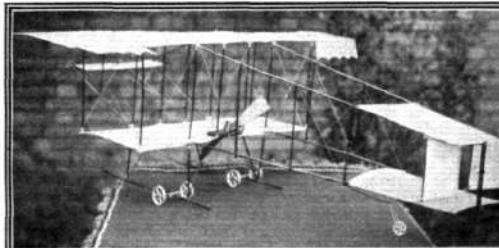
[The most important result of Langley's research was his demonstration of the internal work of the wind. He showed that wind pulsations, gusts, and up currents were sources of energy that could be turned to account by any living creature or machine capable of making use of them. Birds have a natural instinct for taking advantage of every atmospheric condition, but man has not reached to this stage.—ED.]

Aviation and Common Sense.

[1198] With regard to the above article by Mr. F. T. Wilbur in your issue of May 6th, he suggests that the probable cause of many aviators giving up flying, through impaired health and nerve strain, is really due to the effects of a deficiency of oxygen in their blood from the continuous flying in an atmosphere of lessened pressure. It may be interesting to him and others of your readers to know that there is now a small machine, weighing 2 lbs., to be had, which is claimed to make up for this very deficiency, and in a remarkable manner. Let me say that I am not in any way connected with the producers of the machine.

Pontypool.

V. SWANTON.



E. G. Norfield's Model Farman.

MODELS.

Tails on Models.

[1199] With regard to Mr. S. P. Elliot's letter (No. 1083) on tails. I thought that I was the practical originator of the tail twisting device for steering, for I used it on my full-sized glider, which I constructed last April, and found it very efficient for steering and also for balancing.

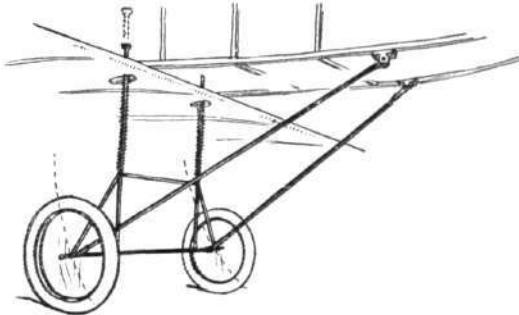
C. B. RIDLEY.

Model Voisin and an Engine Wanted.

[1200] For some time past I have been making a model of the very latest Voisin biplane. That is to say, the type which was shown at the last Paris Salon. The machine has a fuselage of the correct shape and approximately the right size. Will you give me a simple sketch of the landing chassis of the Voisin, and of how it could best be applied to this model. I want to fit it with a petrol engine. Perhaps some reader will advise me what power this ought to be, and how much weight the machine would carry. Each of the main planes measures 5 ft. by 8½ ins. The tail, carried 3 ft. 7½ ins. behind, has an area of about 1 sq. ft. Of course, there is no elevator.

Wellington College.

[The accompanying sketch may perhaps be of assistance. The engine problem is one that must necessarily be determined by the



selection of motors already on the market, which are not very numerous.—ED.]

Model Farman.

[1201] Enclosed herewith are photos of my model Farman biplane. The main planes are 36 ins. span and 6 ins. chord, the gap between the planes 7 ins., and overall length 39 ins. The model is now fitted with another propeller. I may add that it was shown in an exhibition at which it gained a prize.

Cambridge.

E. G. NORFIELD.

Centrifugal Force.

[1202] As "Enthusiastic" (No. 991) invites criticism may I say a few words.

He has fallen into the error that has caught a very large number

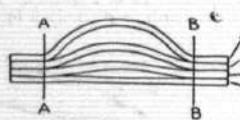
of people when first trying to design a long range centrifugal governor, for that is what he is trying to produce.

The force pulling the propeller-blades out is equal to their weight multiplied by the speed at which they are moving (mv^2), if a small increase in the speed of the propeller causes the blades to move out to twice the distance from the centre, they will be going round a circle twice as big, and if the speed had been constant they would be going twice as far in the time, i.e., at twice the speed, so that they would pull out with four times the force (because the propeller has increased in speed a little they would be going more than twice the speed, and would, therefore, pull more than four times as hard). The spring which is to pull them in has been stretched to twice its length, and, therefore, pulls in with twice the power, and that is not enough, the blades will go on moving out until they smash the spring, or fly off, unless a stop is provided; the action will then be, that the moment the blades move at all they will go right out to the stop and stay there.

Such a governor can only govern by cutting off the power altogether directly the moving part moves radially, the accuracy of the governor depends on the shortness of the distance through which the moving part has to move to cut off the power, and the quickness with which it can move off and on.

The problem can, however, be tackled by varying certain parts (factors), for instance, here is a kind of spring, not necessarily good but it is workable, that would give approximately the result required:—

A number of pieces of elastic, 1, 2, 3, 4, of different lengths, are fastened together so that you can stretch only from AA and BB as shown; it is apparent that as this compound spring is pulled out the strands come into action one after the other, and therefore its inward pull increases more rapidly than, directly as the length to which it is pulled out, by this or some such means the propeller blades could be made to fly out in a series of steps approximating to the speed.



It may interest "Enthusiastic" and others to work out the lengths of these pieces of elastic; as a hint I suggest that they should work to a series of cords joining points along the curve and not to tangents to these points. I have made that mistake.

The fuze used for watch springs is another way.

I congratulate "Enthusiastic" on model making with his head as well as with his hands, which is more than I can say of No. 1011, who has encumbered his model with some useless thing that looks like a Gnome motor, a feat I consider as commendable as if he had carved a portrait model of M. Blériot in soap and stuck that on.

Of course a centrifugal governor cannot govern if it runs at a constant speed, it must govern over a range of speeds; this suggests that probably not only the radius but the pitch of the blades should vary.

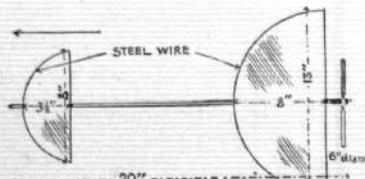
Earls Court.

W. LANGDON-DAVIES.

Model Monoplane.

[1203] I have made a very interesting model monoplane of the tail-first type. Its length is 1 ft. 1 in. Dimensions are as follows:—

Width of largest plane, 1 ft. 1 in.; length, 8 ins.; width of smallest plane, 8 ins.; length, $\frac{3}{4}$ ins.; length of propeller, 6 ins.; width at boss, $\frac{4}{5}$ ins.; width at ends, $\frac{1}{2}$ in.; length of propeller-shaft, 1 ft. 10 ins. The main spar is $\frac{1}{8}$ in. by $\frac{1}{2}$ in. of straight grained



wood, the back spar of the largest plane is $\frac{1}{8}$ in. by $\frac{1}{2}$ in. birch well seasoned; the back spar of the smallest plane is of very small cane. The propeller is of birch 6 ins. in length. The propeller-shaft is of piano-wire running through a piece of tin this shape. In between the two, propeller and angle piece, two porcelain beads are placed. The motive power is three yards of flat strip elastic. The covering is grease paper, two sheets being required.

Bournemouth.

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PUBLICATIONS RECEIVED.

Annual Report of the Board of Regents of the Smithsonian Institution, 1909. Washington, U.S.A.: The Smithsonian Institution.

Monoplanes and Biplanes: their Design, Construction, and Operation. By G. C. Loening, B.Sc., A.M. New York: Munn and Co., 361, Broadway. Price \$2.50 net.

Les Lois Expérimentales de l'Aviation. By Alexandre Sée. Paris: Librairie Aéronautique, 40, rue du Seine. Price 7 fr. 50.



Aeronautical Patents Published.

Applied for in 1910.

Published June 1st, 1911.

8,212.	C. A. B. P. HAWKINS, — OGILVIE AND — NAIRN. Aeroplanes.
11,205.	W. N. BAKER. Aeroplanes.
11,407.	J. H. C. GERBAUER AND G. E. O. LANGR. Flying machines.
11,504.	W. H. FITZGERALD, H. F. WYATT AND — HORTON-SMITH. Aerial machines.
11,882.	A. E. DOWNING. Flying machines.
12,092.	H. GOUGH-TURNER. Flying machines.
12,094.	J. JORGENSEN AND B. BONNIKSEN. Aerial machines.
23,772.	A. WUNDERLICH. Propellers for flying machines.
28,670.	H. GAARA. Aeroplanes.
30,132.	J. O. WRENN. Feathering blades for aerial navigation.

Applied for in 1911.

Published June 1st, 1911.

426.	M. F. DE R. DE COLOMBIER. Propelling flying machines.
5,312.	H. GOUGH-TURNER. Clinometers for flying machines.

DIARY OF COMING EVENTS.

British General Events.

July 1	Gordon-Bennett Aviation Cup Contest.
July 22-Aug. 5	Daily Mail Round England Contest.
Oct. 31	Close of British Michelin Cup.

Foreign Fixtures.

May 28-June 15	Paris—Rome—Turin.
June 18	European Circuit—Paris, Brussels, London, Paris.
July 11	Paris—Bordeaux—Paris.
July	Italian Circuit.
July 1-13	Circuit Berlin—Hanover—Hamburg.

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